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VITAMINS IN THE NUTRITION OF CHILDREN.¹

By DONALD VICKERY,
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In considering the vitamins and the part they play in the nutrition of the child, it is probably best to view them from the standpoint of the diseases which may occur if they are deficient in any marked degree in the diet. Most of the diseases which commonly come within this category are now styled "deficiency diseases", because they are believed to be due to the deprivation of some essential element.

As there are many elements besides vitamins which are essential for nutrition, and in the absence

of which symptoms occur, it seems a great pity to restrict the term "deficiency diseases" to those due to deprivation of vitamins alone. Deficiencies with respect to iodine, iron, calcium, phosphorus and even sodium chloride all produce definite traces of symptoms which have just as much right to be regarded as pathological entities or symptom complexes as any of the more generally recognized avitaminoses.

We very rarely meet with what may be called a clear-cut or classical example of a deficiency disease, that is, one which is due to deprivation of only one essential element in the dietary; for when there is one defect in a diet it is almost sure to be accompanied by other deficiencies or excesses. In this connexion it must be remembered that there may be many diseases and symptom complexes due to excesses as well as to deficiencies. Rickets, for example, as generally described, appears to be a

¹Read at a meeting of the New South Wales Branch of the British Medical Association on May 26, 1938.

mixture of various symptoms due not only to deficiencies, but also to excesses of various food elements, such as cereals and starchy food. It is certainly not a clear-cut pathological entity, due exclusively to a deficiency of vitamin *D*. What is true of rickets is also more or less true of all the other deficiency diseases which have been honoured with a special title. They very seldom present themselves in a pure form.

In dealing with a subject like this one can easily quote many tedious figures, unable to be remembered for clinical purposes by the average mind. I am convinced that the human child does not require "biochemically" correct dosages of vitamins in order to thrive, but has a reasonable adaptability to dosage; and by its delicate mechanism of storage and elimination it can correct any reasonable defect in dosage. In addition, each child has its own individual metabolic rate; and any figures which I quote in this paper I want you to accept as a reasonable working standard and not as absolutely biochemically correct.

First, an easy method of estimating the caloric requirements of infants and children is of advantage, as certain vitamin dosages are estimated at so many international units for every 100 Calories of food consumed (see Table I).

TABLE I.
Caloric Requirements of Infants and Children.

Age.	Number of Calories per Pound of Body Weight.
First 3 months	50
4 months	49
5 months	48
6 months	47
7 months	46
8 months	45
9 months	44
10 months to 12 months ..	43
1 to 2 years	42
2 to 5 years	40

Vitamin A.

Until recently it has been the general view that the functions of vitamin *A* are twofold: (i) to promote growth, and (ii) to raise resistance to infection. It is now more generally believed that vitamin *A* has to do with the mechanism of the healthy state of skin and mucous membranes, and in keeping these surfaces in a state to resist the invasion of organisms. It is hardly logical to expect that the administration of therapeutic doses of this vitamin will have much influence in curing established infections, such as those due to septic, pneumonic or coli organisms; but it is reasonable to prescribe this vitamin in order to prevent the breaking down of the natural barriers to bacterial invasion which intact epithelial surfaces afford.

Vitamin *A* is present in milk, fat, eggs, cod liver oil, halibut liver oil, carrots and other vegetables. It cannot be synthesized in the body. There is evidence, however, that animals can convert carotene into vitamin *A*. In infants it is usually prescribed as one of the liver oils, being in com-

bination with vitamin *D*. The prophylactic requirement of infants with respect to vitamin *A* is 300 international units for every 100 Calories of food consumed. Admitting that the potency of breast milk differs in respect to vitamin *A* with its source and with the nature of the food consumed by the mother who supplies it, it may be assumed that on an average breast milk contains 60 units per ounce. The requirements of totally breast-fed infants are barely satisfied as a child approaches six months of age, and it is wise to add cod liver oil or halibut liver oil daily; one-half drachm of cod liver oil contains 1,000 units, and one minim of halibut liver oil contains 1,000 units.

TABLE II.
Caloric Requirements of Infants and Children.

Age.	Weight in Pounds.	Total Calories Required.
At birth	7 to 8	350 to 400
3 months	11 to 12	550 to 600
6 months	15 to 16	700 to 750
12 months	22 to 24	900 to 1,000
2 years	26 to 28	1,100 to 1,200
5 years	38 to 40	1,400 to 1,600

Vitamin B.

The whole subject of vitamin *B* deficiency symptoms is complicated by the fact that vitamin *B* is not a single entity, but a complex consisting of different factors, each possessing slightly different properties. Six factors are recognized. The anti-neuritic and beriberi-preventing properties of the vitamin *B* complex are said to be attached exclusively to the *B*₁ fraction. This is destroyed by heat; while the pellagra-preventing properties are associated with the *B*₂ fraction, which is thermostable. We rarely see these classical pictures of vitamin *B* complex deficiency here in Australia; but there are many minor symptoms, which take the form of delayed growth, imperfect nutrition, and especially of disorders of function of the gastrointestinal tract, such as loss of appetite, intestinal stasis and constipation, which are due to deficiency in the vitamin *B* complex.

The vitamins of the *B* group are found in seeds and eggs, peas and beans, and in cereals, in the germ and the bran, also in yeast and "Marmite", malt extract and meat. Vitamin *B*₁ and vitamin *B*₂ have been standardized. "Marmite" is particularly rich in the *B*₂ factor. It has been estimated that the minimum requirement of *B*₁ for infants and children is represented by 30 international units for every 100 Calories of food consumed; and if a concentrate of the whole vitamin contains a sufficiency of the factor *B*₁ it may be assumed that it will also contain about the correct dosage of all the other factors. Human milk contains five international units per ounce; cow's milk contains 6.2 international units per ounce. There is likely to be a slight deficiency of this vitamin in wholly breast-fed infants, and a definite deficiency in infants fed on diluted cow's milk.

There seems little danger in giving vitamin *B*₁ complex in excess. The best form in which to give

it to infants and children is in egg yolk, "Marmite", "Bemax" and yeast-containing foods. I am of the opinion that vitamin *B* complex is of all vitamins the most deficient in the diet of Australian children. It is present in its main form in cereals and certain vegetables and eggs; but these are so treated by being cooked and refined before being consumed that the vitamin *B* complex is either removed altogether, especially from our cereal foods, or is rendered more or less useless by the processes to which it is submitted. If "Bemax" or some similar preparation were on the breakfast table every morning, constipation, loss of appetite and many other minor disorders of health and growth would be corrected in infants and children. The human subject appears to have little or no power of manufacturing this vitamin *B* complex or of storing it for any great period of time, so that the supply requires to be constantly replenished.

Vitamin C.

Infantile scurvy is a somewhat peculiar disease, in that it takes a considerable time for the recognizable symptoms to develop under the influence of vitamin *C* deprivation; but when they do display themselves there is no mistaking them, owing to their dramatic and fulminating character. This does not imply, however, that there are no pre-stages of scurvy which are pathological in character and detrimental to health. The symptoms, however, of subscorbutic conditions in children are very difficult to recognize by ordinary clinical means, for they appear to be merged in those of general malnutrition.

We are now able to recognize vitamin *C* deficiency in suspected cases by urinary analysis. It appears that infants and children must be supplied with a definite quantity of vitamin *C* if the development of scorbutic and subscorbutic states is to be avoided, and that under normal conditions a certain proportion of the necessary intake is excreted in the urine. When, however, the system becomes depleted of this essential acid and a subscorbutic condition is threatening, analysis of the urine discloses an absence of ascorbic acid; and this absence prevails for a time in spite of oral administration of considerable quantities of the vitamin, until the depleted tissues become again saturated. The normal output of ascorbic acid in the urine is between 0.01 and 0.02 milligramme per cubic centimetre; assuming an infant passes 600 cubic centimetres (twenty ounces) of urine in a day, in twenty-four hours between 5.6 and 11.2 milligrammes of ascorbic acid are excreted. It may be assumed, since scurvy practically never develops in breast-fed infants, that human milk contains an adequate amount of the vitamin to protect against this deficiency disease, provided, of course, that the milk is normal and the supply adequate.

Since the average amount of ascorbic acid in breast milk is 0.056 milligramme per cubic centimetre, and since the average amount of breast milk consumed by infants for three to nine months is between 500 cubic centimetres and 1,000 cubic centi-

metres, the total amount of ascorbic acid consumed will be between 28 and 56 milligrammes in the twenty-four hours. Such quantities are practically never supplied when infants are fed on artificial substitutes for breast milk. Fresh cow's milk contains on an average only 0.02 milligramme per cubic centimetre, less than half that of breast milk. Moreover, it is almost invariably diluted, boiled or heated. Artificially fed children should therefore receive nearly the full prophylactic dose of ascorbic acid in the twenty-four hours, apart from that afforded by their milk dilutions. One cubic centimetre of orange juice contains about 0.68 milligramme of ascorbic acid; one ounce of orange juice contains 20.0 milligrammes of ascorbic acid. So that half to one ounce of orange juice more than supplies the urinary loss of vitamin *C* in a normal infant. At one year of age one to two ounces of orange juice daily should be taken by the normal child to ensure that this vitamin is adequately supplied.

Vitamin D.

Vitamin *D* is so closely linked with the metabolism of calcium, phosphorus and fat that it is impossible to consider it solely as the cause of rachitic conditions in children. The bony defects in rickets may yield to the administration of a few units of vitamin *D*; but the anaemia, catarrh, muscular flabbiness, the laxity of ligaments, the sweating and nervous irritability, must all be treated on appropriate lines in accordance with their specific origin.

The natural sources of vitamin *D* are butter, fat, cream, milk, liver, kidneys, yolk of egg and, of course, cod liver oil and halibut liver oil and sunlight. Fat, of all the three food elements, is the most difficult of digestion with the great majority of children. If the fat is imperfectly digested there is strong clinical evidence that the vitamin *D*, as well as the vitamin *A* contained in it, is imperfectly absorbed. There are all grades of fat indigestion or failure of fat absorption, up to the extreme degrees seen in coeliac disease. Here in Australia vitamin *D* has become the most abused of all the vitamins, both by the medical profession and by the lay public. Not so much is it abused in the treatment of children under eighteen months of age as in that of children from two years onwards. Almost every form of indefinite ill health in young children is treated by the administration of some form of vitamin *D* and its associated vitamin *A*, when in many cases what is required is a reduction of the fatty food which contains these vitamins and the correction in this way of the indigestion which is often the cause of the child's ill health and the cause of the failure of absorption of vitamins *D* and *A*. Vitamin *D* is the one vitamin which we are certain can be manufactured in appreciable amounts by the human child, given the correct environment; and in this country, in both winter and summer, that correct environment of sunlight,

fresh air and exercise exists, especially for children once they are able to run about and escape from the indoor life so often unnecessarily enforced on the infant. As for prophylactic dosage of vitamin D, Dr. L. J. Harris has suggested 250 international units at birth, with a slow increase to 1,500 international units at one year of age. A good sample of cod liver oil contains approximately 350 international units per drachm. One-half to four teaspoonfuls of cod liver oil or one to eight teaspoonfuls of clinic emulsion is the recommended dose in infants up to one year. For the reasons stated above there is no need to increase this dosage after one year of age. Most of the mild cases of rickets we see here in Australia automatically cure themselves after this age, provided that the children are let out of doors, and provided that they are not kept on a high-starch diet, deficient in fats and proteins.

The great advantage of preparations such as "Radiostol", "Ostelin", "Viosterol", "Calciferol", halibut liver oil, "Radiostoleum", "Adexolin" *et cetera* is, first, that high therapeutic dosages can be given; secondly, that children intolerant of excessive fat can be given larger dosages without digestive upsets being precipitated; and thirdly, that in summer time, when fat is not well tolerated or so much required in the diet, the vitamin content can be still kept up to requirements.

Conclusions.

In conclusion, then, in order to procure the best nutrition amongst children here in Australia we should endeavour to make child feeding as simple as possible in its application, especially in the administration of vitamins. In infants the addition of clinic emulsion and sunlight and occasionally a preparation such as "Radiostoleum" will supply all the vitamin A and vitamin D requirements; "Bemax" and "Marmite" and egg yolk will supply the vitamin B complex deficiencies, and orange juice the vitamin C deficiencies.

In older children, milk, eggs, butter and fat, and an outdoor existence should supply all vitamin A and vitamin D requirements; "Bemax" or "Marmite" or malt is a necessary addition to supply the vitamin B complex so often deficient at this age. Orange juice and other fruit juices, potatoes and tomatoes are necessary for the vitamin C requirements.

Vitamin E, which is related closely to normal functioning of the reproductive apparatus, I have allowed to look after itself. It is present in the embryo of wheat, in seeds, green vegetables and olive oil. The addition of "Bemax" will supply the requirements.

It is impossible in the short time available to give more than an outline of the vitamin requirements of child nutrition; but I have attempted to be as simple, as brief and as practicable as possible.

Acknowledgement.

I wish to acknowledge the help I have received in the preparation of this paper from Eric Pritchard's recent book "The Infant".

THE NUTRITION OF CHILDREN.¹

By EDGAR H. M. STEPHEN, M.B., Ch.M.,

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In addition to her harbour and the bridge Sydney has several advantages. She is able to provide for her children two very important assets in assisting their nutrition. The first is a very liberal supply of sunshine, both in winter and summer, and the second, which depends somewhat on this feature, opportunity for life spent in the open air and for the taking of abundant exercise, both on the beaches and elsewhere. Children in all grades of society are fortunately restless and assist in increasing the value of their diet by their instinctive energy. They are always hurrying from one unnecessary activity to another, and the lack of concentration of their earlier years helps them to accomplish still more miles and to flourish exceedingly.

I was lately thrilled to see two small girls hopping hundreds of times, crossing and uncrossing their legs, on a pathway in the park. It was a perpetual perspiration day, but this did not detract from the joy of their pastime. The heaven-sent scooter is another blessing, seldom extolled as highly as it deserves to be. The advantage of surroundings that are cheerful was the subject dilated on by an embryo specialist of more than average refinement when addressing a mother from a London slum. He told her that flowers on the table would prove invaluable to her child. He may have been right; but in my own case it would take an anæsthetizing dose of freesias and tuberoses before I would face the horror of an onion. However, I agree that a wrangle at meals or a "cross" nurse does not aid digestion, even if there are lilies of the valley on the table.

And now for the rules of diet that are to make children healthy, with firm muscles, even tempers and a longing for activity; for with satisfactory nutrition all these qualities, with a capacity to resist infections, will be achieved. In the days of my youth breakfast and tea were meals of bread and butter, porridge and bread and milk. There was far too little protein. Fruit was expensive and scanty in the child's menu, though I believe Queensland children have always had plenty. In early days in my general practice parents were inclined to nourish their children on cod liver oil and emulsions, with no excessive interest in foodstuffs. Nowadays it is generally recognized that there are better ways of feeding children, and the value of bodily exertion is duly appreciated.

CONSIDERATIONS OF DIET FOR CHILDREN.

The year 1938 belongs to a century distinguished in the British Empire by the fact that the white members of it have extraordinarily small families.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on May 26, 1938.

It is therefore very necessary that the comparatively few children of the rising generation should be preserved. No one can deny that the institutions that work for the welfare of mothers and infants have succeeded in lessening disease and mortality in infancy and in assisting infants to thrive. It is from the age of twelve months onwards that less uniformity in diet exists; and it is my purpose to suggest what appears to me a good standard diet and considerations favouring its adoption.

It is necessary to provide a sufficient number of calories to maintain life, and in addition to that, extra is required to encourage growth; and still more calories are required to provide for the activities of the child.

There are still mothers to be found who endeavour to limit drastically the amount of meat provided for their two-year-old and three-year-old children. In a tone of triumph I was told recently that a boy of six years had rarely tasted meat. With some courage he was now being allowed it once a week.

It is now being recognized that animal protein promotes growth; and meat, fish, poultry and eggs are introduced into the diet of children in the second year of their life. These substances are first-class protein, and are to be highly prized. Cheese ranks with them, and so does milk in a more dilute degree. The protein of vegetables is second class in grade. It feeds, but does not stimulate growth, as does its more distinguished and expensive partner.

Fats are the next important consideration. Everyone, even he who dines at luxurious clubs, is aware that proteins and fats are the expensive articles of food, and that carbohydrates are much cheaper and more plentiful.

A sufficiency of fat is desirable, as it maintains the body temperature and is valuable for its vitamin content.

Carbohydrates are a source of muscular energy and heat. One of the properties of sugar is its ability to retain the fluids in the tissues. For the proper metabolism of fats, carbohydrate must be present; hence sugar must be added to dilutions of cow's milk and to the simple dried milk foods. Also a goodly supply of vitamin C is obtained from the carbohydrates, fresh orange, grape, grapefruit, lemon, potato, tomato and turnip juice.

If an excess of protein, fat or carbohydrate is provided in the diet the following penalties may result. Excess of protein produces alkaline, constipated motions, which are foul-smelling. The stools are green or yellow and contain curds if casein is in excess. Excess of fat interferes with the gastric digestion of proteins, and may set up fat constipation, fat dyspepsia or fat diarrhoea. In fat dyspepsia, vomiting may occur. This is usually half an hour to an hour after food, and the vomitus has the odour of rancid cream. In fat diarrhoea the stools are loose, acid, often pale, greasy, and mixed with much mucus. A capricious appetite, irritability and the passage of ammoniacal urine are encountered in patients whose diet contains an excess of fat.

With foods containing an excess of sugar, such as some oversweet proprietary foods, the infants become soft, overweight and pale. A continued excess may produce an acid diarrhoea, especially in the hot weather.

The question of roughage must be considered. Its intentional inclusion is not so fashionable as a few years ago. With a standard diet sufficient roughage is obtained. For certain children, more especially in certain morbid conditions, it has to be reduced. If it is desired to increase the amount of roughage in the diet, the following vegetables have a high cellulose content: leafy vegetables, cauliflower, spinach, turnips, onions, parsnips, pumpkin, sweet potatoes, beans, lentils, carrots *et cetera*; the following fruits have a high cellulose content: apples, bananas, dates, prunes, peaches, pears, melons, raisins and rhubarb.

I have extracted from Thomas Saxl's "Pædiatric Dietetics" some observations on inorganic salts or minerals required by the body. These substances are important, as they control largely the physico-chemical mechanism of the tissues.

The body framework contains chiefly phosphates and carbonates of calcium and magnesium; the body fluids contain chlorides and bicarbonates of sodium; and the cells, chlorides, bicarbonates and phosphates of potassium and magnesium. Iodine is an essential constituent of the thyroid gland, and iron of hæmoglobin and muscle cells.

Milk is a rich source of mineral matter, inasmuch as it contains all the necessary inorganic salts. Green vegetables contain sodium, potassium, small amounts of calcium, iron and traces of iodine. Fruit and fruit juices contain a fair amount of potassium. Cow's milk supplies an adequate amount of sodium. Bread, cheese and salt butter also provide sodium. Any normal diet, with the addition of cow's milk, supplies sufficient potassium. Of calcium, milk is the most satisfactory source. An allowance of 45 cubic centimetres (one and a half ounces) of milk per pound of expected body weight provides adequate calcium salts for normal requirements.

All forms of milk, rennet cheese and egg yolk *et cetera* supply calcium. Magnesium is obtained from cow's milk, vegetables and meat. Phosphorus is obtained from meat peptone, meat, milk, eggs, fish, whole-wheat products, yeast, "Marmite" *et cetera*. Iron comes from beef, eggs and certain vegetables. Copper comes from calves' liver, dried fruits, legumes *et cetera*. Iodine is obtained from milk, eggs, fish liver oils and leafy vegetables.

I shall give you a table which shows the standard of weight which one should expect for normal children. I have checked these figures against the tables prepared by Harvey Sutton some years ago and those prepared by Arthur Mee and Bjelke-Petersen. The figures I now present were obtained from Geneva and are in my opinion correct; they are adopted in the Royal Alexandra Hospital for Children Pharmacopœia. These figures are for boys; the weight for girls is a pound or so less up

till the age of twelve years, when girls for three or four years are one pound or so heavier.

TABLE I.
Average Weight Measurements for Boys.

Age in Years.	Weight.	
	Pounds.	Ounces.
1	20	0
2	26	8
3	31	0
4	35	0
5	39	0
6	43	0
7	47	0
8	52	0
9	57	0
10	62	8
11	68	0
12	73	11

In the diabetic clinic at the Royal Alexandra Hospital for Children are fifteen children on whom observations over several years have been made. I have excluded children who have been under treatment for a year or less. Their diet has been proved sufficient, as their weight has not only been maintained, but has increased most satisfactorily with advancing age. Their general health has been excellent, and they have been rather freer of intercurrent disease than most non-diabetic children.

The number of Calories allowed is shown in Table II.

TABLE II.

Age in Years.	Calories Allowed.
2-5	1,230
4	1,300
5	1,400
6	1,500
7	1,600
8	1,700
9	1,800
10	1,900
11	2,000
12	2,100 to 2,400

You all know that Pritchard is an authority on the feeding of infants and young children; and some of his statements I shall retail to you, feeling, as I do, that they are entirely sound.

The child one year old requires 30 grammes (one ounce) of protein in the twenty-four hours. This could be provided by 708 cubic centimetres (25 ounces) of cow's milk, 283 grammes (10 ounces) of bread, 170 grammes (6 ounces) of lean meat, 170 grammes (6 ounces) of egg, or 345 grammes (12 ounces) of fish.

It is wise to limit the milk intake to one pint. This leaves 70 grammes (one-quarter ounce) of protein to be provided by bread, egg, meat or fish.

As regards carbohydrates, give four or five times as much as the amount of protein to the child of one year, that is, between 115 and 140 grammes (four and five ounces), in twenty-four hours. With increased activity, as in a child of five years, give six to seven ounces. At one year give equal quantities of soluble carbohydrate (sugar) and

insoluble carbohydrate (starch). At two years of age, if need be, the child ought to be able to dispense with sugar altogether.

Pritchard speaks coldly of porridge and appreciatively of good wheaten bread, especially when toasted, as it needs mastication and helps to develop the jaws.

As regards fats, in human milk fat exists in the proportion of 3.5%, compared with 1.5% of protein.

At one year of age the child needs 45 grammes (one and a half ounces) of fat in twenty-four hours, at five years 52.5 grammes (one and three-quarter ounces). The soap derived from the fat of the milk provides the roughage of the infant's stool. One pint of milk (the daily ration) contains 22.5 grammes (three-quarters of an ounce) of fat. The balance should be obtained from butter, dripping, bacon fat or cream, or from animal oils, halibut liver oil, cod liver oil, butter and oleo-fat.

The total quantity of food required at one year of age is 30 grammes (one ounce) of protein food, 30 grammes (one ounce) of fat, and 115 to 140 grammes (four to five ounces) of carbohydrate food (sugar or starch).

At five years of age two-thirds as much again is needed.

The caloric value of protein is 116 per ounce, that of sugar 116 per ounce, and that of fat 263 per ounce.

If fed on human or cow's milk alone, the yearling would require 1,334 cubic centimetres (forty-seven ounces). He would need 184 grammes (six and a half ounces) of dried milk or 272 grammes (nine and a half ounces) of condensed milk.

In the appendix are some standard diets kindly prepared for me by Miss Eisenberg, dietitian at the Royal Alexandra Hospital for Children.

In the first three, schemes are given for the provision of protein in the diet, 10% to 15% of the total Calories being of this element. Of these Calories, 50% to 75% should be of first-class protein.

The next two are complete diets for boys of three years and eleven years of age.

The final scheme shows, amongst other points, the mineral content of various vegetables.

You will note that in these diets the number of grammes of protein is equal to the number of grammes of fat, while the number of grammes of carbohydrate is three times as large. These proportions are in my opinion to be advised.

Pritchard recommends four to five times as much carbohydrate as protein or fat, and gives a more liberal supply of total Calories; but for life under conditions existing here I consider our dietitian's allowance is to be preferred.

APPENDIX.

Diet of a Caloric Value of 1,000 for a Boy Aged Two Years.

The normal weight for a boy aged two years is 10.25 kilograms (23 pounds). His protein requirement is 3.5 grammes per kilogram of body weight, a total of 36 grammes. This is equivalent to 144 Calories, which is 14% of the total Calories required. From 10% to 15% of the

total calories in an average diet should be got from protein; and of these calories 50% to 75% should be got from first-class protein.

The protein may be obtained in the following ways. First-class protein may be derived from one pint of milk (20 grammes) and one egg (6 grammes); second-class protein may be derived from 56 grammes (two ounces) of bread (6 grammes) and 29 grammes (one ounce) of oatmeal (5 grammes). This gives a total protein of 37 grammes.

An alternative arrangement would be to supply first-class protein by giving one pint of milk (20 grammes), one egg (6 grammes) and one ounce of fish or meat (6 grammes). Second-class protein could then be derived from 15 grammes (half an ounce) of oatmeal and 29 grammes (one ounce) of bread. The total protein would then be 37.5 grammes.

Diet with a Calorific Value of 1,500 for a Boy Aged Six Years.

The normal weight for a boy aged six years is 20 kilograms (44 pounds). He requires 2.5 grammes of protein per kilogram of body weight; this gives a total of 50 grammes, which is equivalent to 200 Calories, 13% of the total Calories.

The first-class protein may be made up of one pint of milk (20 grammes), one egg (6 grammes) and two ounces of meat or fish (12 grammes). The second-class protein may be derived from three ounces of bread (9 grammes) and one ounce of oatmeal (5 grammes). The total protein would then be 52 grammes.

Diet with a Calorific Value of 2,000 for a Boy Aged Eleven Years.

The normal weight for a boy aged eleven years is 30.1 kilograms (66 pounds). The protein requirement is 2.5 grammes per kilogram of body weight, a total of 77 grammes. This is equivalent to 308 Calories, 15% of the total calories.

The first-class protein may be made up of three-quarters of a pint of milk (15 grammes), one egg (6 grammes), three ounces of meat or fish (18 grammes), one ounce of bacon (5 grammes) and one ounce of cheese (8 grammes).

The second-class protein may be derived from four ounces of bread (12 grammes), two ounces of porridge (10 grammes) and three ounces of potato (3 grammes). The total protein is then 77 grammes.

Normal Balanced Diet for a Boy Aged Three Years.

(Approximate weight, 13 kilograms; man value, 0.4; Calories per kilogram, 100; total Calories, 1,350.)

Menu for One Day.

Breakfast: Porridge or cereal, with milk and sugar. Milk or milk cocoa to drink. Boiled or lightly scrambled egg. Bread and butter.

10.30 a.m.: Milk to drink. "Marmite" sandwich or biscuit with "Marmite".

Midday Dinner: Mashed or well-boiled or steamed jacket potato. Green or red vegetable. Well-minced or chopped meat or fish. Cereal pudding with stewed fruit.

Evening Meal: Milk to drink (may be given as junket and fruit). Bread and butter with honey (drink substituted). Fresh raw fruit or salad or stewed fruit or banana custard or fruit in jelly.

7.30 p.m.: Drink of milk (warm) if awake and thirsty.

TABLE III.

Meal.	Carbohydrate Content in Grammes.	Protein Content in Grammes.	Fat Content in Grammes.
Breakfast	49.0	17.5	19.35
10.30 a.m.	24.0	9.0	13.35
Midday dinner ..	46.0	15.5	9.8
Tea	49.0	10.5	13.5

TABLE IV.

Nutrition Value of Menu for a Boy Aged Six Years.

Time of Meal.	Food Given.	Nutrition Value in Grammes.				
		Carbohydrate.	Protein.	Fat.	Total Carbohydrate.	Total Protein.
Breakfast, 8 a.m.	1 tablespoon "Quaker Oats", soaked overnight and cooked in morning..	10.0	2.5	—	49.0	17.5
	2 oz. milk on porridge	3.0	—	2.4		
	4 oz. milk to drink	6.0	4.0	4.8		
	1 oz. sugar on porridge and in cocoa..	15.0	—	—		
	1 oz. bread with crust on	15.0	3.0	—		
	1 oz. butter (one pat)	—	—	6.15		
	1 egg	—	6.0	6.0		
10.30 a.m.	6 oz. milk to drink	9.0	6.0	7.2	24.0	9.0
	1 oz. bread	15.0	3.0	—		
	1 oz. butter	—	—	6.15		
	"Marmite" to spread	—	—	—		
Dinner, 1 p.m.	2 oz. potato	10.0	2.0	—	46.0	15.5
	1 oz. cooked meat or fish	—	8.0	5.0		
	2 oz. green vegetable	3.0	—	—		
	1 teaspoon rice	6.0	1.5	—		
	4 oz. milk, cereal pudding	6.0	4.0	4.8		
	1 oz. sugar	7.5	—	—		
	1 oz. stewed fruit with 1/2 oz. sugar	13.5	—	—		
Evening meal ..	6 oz. milk to drink	9.0	6.0	7.2	49.0	10.5
	1/2 piece fruit (raw), about 2 oz. ..	6.0	—	—		
	1/2 oz. bread	22.5	4.5	—		
	1/2 oz. butter	—	—	6.3		
	1/2 oz. honey	11.5	—	—		

Daily intake: carbohydrate, 168 grammes; protein, 52.5 grammes; fat, 56 grammes. Total Calories, 1,350. Adequate first-class protein (36 grammes or 144 Calories, 10% of diet). Adequate dairy and market garden foods, eggs, milk, fruit and vegetables. Therefore diet is complete with minerals and vitamins. Cod liver oil or "Halivol" may be given during winter months to augment sunshine if necessary.

Suggested Daily Diet for a Child Aged Eleven Years.

(Approximate weight, 30 kilograms; man value, 0.7; Calories per kilogram, 80; total Calories, 2,400, including an allowance of 300 Calories for six hours' exercise per day.)

Breakfast: Porridge or cereal with sugar and milk. Milk to drink. Bread and butter and jam or honey. One egg or its equivalent in fish or bacon or meat.

11 a.m. (at school): Milk to drink. Sandwich or biscuits with butter and "Marmite" or peanut butter *et cetera*.

Lunch (at school): Cheese sandwiches (and a tomato or lettuce). One piece of sponge cake. One piece of fruit.

4 p.m. (at home after school): One piece of fruit.

Dinner: Meat and vegetables (potato and green vegetables). Pudding (rice custard with stewed fruits).

Total daily diet: 286 grammes of carbohydrate, 92.5 grammes of protein, 101.8 grammes of fat. Total calories, 2,440. First-class protein, 60 grammes, equivalent to 240 calories, or 10% of total calories.

Food Mentioned in the Diets.

First-class protein, complete with all the amino-acids, is found in all animal protein. In this country fresh meat

TABLE V.

Meal.	Carbohydrate Content in Grammes.	Protein Content in Grammes.	Fat Content in Grammes.
Breakfast	100.0	25.0	27.9
11 a.m.	24.0	9.0	13.35
Lunch	92.5	22.0	36.6
Dinner	69.5	36.5	24.0

is so inexpensive that even the poorest of people can get their first-class protein by using meat itself.

The green and red vegetables mentioned in these diets may be the following.

Green vegetables: cabbage, lettuce, cauliflower, celery, spinach, peas, beans, cucumber.

Red vegetables: pumpkin, tomatoes, carrots (rich in carotene), swede turnips.

TABLE VII.

Some Mineral Contents of these Vegetables.

Vegetable.	Mineral Content.		
	Iron.	Calcium.	Phosphorus.
Cabbage	0.433	0.045	0.089
Carrots	0.64	0.056	0.046
Spinach	2.55	0.067	0.068
Turnips	0.52	0.064	0.046
Tomatoes	0.44	0.011	0.026
Peas (dried) ..	5.7	0.084	0.400
Pumpkin	—	0.023	0.059
Celery	0.005	0.078	0.037

TABLE VI.

Nutrition Value of Menu for a Child aged Eleven Years.

Time of Meal.	Food Given.	Nutrition Value in Grammes.					
		Carbohydrate.	Protein.	Fat.	Total Carbohydrate.	Total Protein.	Total Fat.
Breakfast ..	1 oz. oatmeal	20.0	5.0	—	100.0	25.0	27.9
	4 oz. sugar	15.0	—	—			
	8 oz. milk (some on porridge) ..	12.0	8.0	9.6			
	2 oz. bread	30.0	6.0	—			
	4 oz. butter	—	—	12.3			
	1 oz. honey or jam	23.0	—	—			
	1 egg	—	6.0	6.0			
11 a.m. ..	6 oz. milk	9.0	6.0	7.2	24.0	9.0	13.35
	1 oz. bread	15.0	3.0	—			
	4 oz. butter	—	—	6.15			
	"Marmite"	—	—	—			
Lunch ..	Sandwiches:	60.0	12.0	24.6	92.5	22.0	36.6
	4 oz. bread						
	1 oz. butter						
	1 oz. cheese						
	3 oz. lettuce or tomato or celery ..						
	1 piece of sponge cake (about 2 oz.) ..						
	3½ oz. fruit (one piece), 15% ..						
Dinner ..	3 oz. meat (cooked), approximately ..	—	24.0	15.0	69.5	36.5	24.0
	3 oz. potato	15.0	3.0	—			
	4 oz. green vegetable	4.5	—	—			
	1 egg	—	—	—			
	5 oz. milk	7.5	3.0	3.0			
	4 oz. sugar	7.5	5.0	6.0			
	Vanilla	—	—	—			
	3½ oz. stewed fruit	12.5	—	—			
	4 oz. sugar	15.0	—	—			
	4 oz. bread	7.5	1.5	—			

THE NUTRITION OF THE CHILD.¹

By F. S. HANSMAN,
Sydney.

THE nutrition of the child must be considered in relation to the question of nutrition in general. Before discussing any problem it is necessary to define it.²

One can see, therefore, the truth of the old adage, "Every man is a law unto himself", and at this early stage one can stress the impossibility of ever trying to reach an ideal nutrition. Furthermore, it raises the question whether an ideal nutrition would be best for certain individuals, because in the light of our general knowledge we can safely conclude that it is not necessarily in the best interests of every individual to allow him to attain his intrinsic normality. So long as there is no contraindication from the presence of so-called metabolic disorders, the best that can be done is to provide ample foodstuffs that contain essential substances. How this may be accomplished will be discussed later.

I now wish to digress for a moment to advance a theory. The usually accepted definition of allergy is "changed reaction"; that is, that a sensitized person when exposed to an allergen manifests certain phenomena which a normal person does not. The definition presupposes that there is a reaction of some kind in the normal person, but the allergic response which can be taken as the indicator of this reaction is absent. Broadly speaking, some immunological process must be invoked both in normal and in allergic individuals. Now practically all foods contain substances which can act as allergens, and the response in sensitive individuals may be asthma, migraine, urticaria, dermatitis, dyspepsia *et cetera*. The important deduction I wish to bring out is that the preliminary changes of an immunological character which result in sensitive people in an allergic response also go on in normal individuals, but no allergic response results; in other words, I suggest that we have to be immunized to practically everything we eat. Normally there is no indication of this, a type of subclinical immunization; but in sensitive subjects a modified immunization results in an allergic response. The only novelty of what has just been said is in the mode of expression. The conception of the thesis is to be found in such popular sayings as "You have got to get used to it", "Acquired taste", "This or that food disagrees with me", "One man's meat is another man's poison". A particular food often results in allergic states only during childhood, and it is

generally known that urticaria is more common in children than in adults. The health centres and the mothers recognize the implications of the thesis by weaning babies gradually onto new foods. The deduction that arises from this is that we must not think of our food as being entirely passive in the chemical transactions which go to make it part of ourselves.

There is one further consideration. In assessing food requirements for maintenance purposes in children we cannot restrict ourselves to a formula such as $3/2$ of the basal heat production, which is fairly satisfactory for adults. Children are growing as well as maintaining; their activities are greater and their movements in general are less economical than those of adults.

To pass now to the results of our research work. One hundred and forty-four healthy children of the lower and middle classes were examined, and the following data were collected: sex, height, weight, surface area from Du Bois's formula from height and weight, age, fasting blood calcium and phosphorus content, and haemoglobin value. They were examined for the presence of *genu valgum*, idiopathic scoliosis, dental caries. The history of vitamin D feeding, illnesses and average weekly consumption of food were also ascertained. From the latter we were able to find out their intake of various foodstuffs, for example, milk, eggs, first-class protein, carbohydrate, fat *et cetera*, and of salts, calcium, phosphorus and iron.

The data were then analysed statistically by Dr. Carr Fraser in an attempt to see whether the physical development of the children could be correlated with: (i) the total calorie intake, (ii) the daily intake of calcium or phosphorus. Sherman says in his book "The Chemistry of Food and Nutrition" that "Baldwin voices the opinion of many American investigators in his statement that normal growth in weight and height is probably the best single index of good health and good nutrition during childhood". It seems to us that the surface area, which is an index derived from weight and height, should be a valid expression of development.

By employing what is known as partial correlation, it is possible to see the effect of each of these variables, total calories, calcium and phosphorus, after elimination of the effect of the others. By the same method age can be eliminated, so that the whole 144 children could be considered as a group. We consulted Mr. Sawkins, statistician to the Industrial Commission of New South Wales, and Dr. Cotton, of the physiology department of the University of Sydney, and they agreed that this method of approach was valid.

Briefly, the analyses showed that the physical development of the child was not related to the total caloric intake or to the intake of calcium, but bore a definite relationship to the intake of phosphorus. Another way of expressing our results is by saying that there is no evidence from our data that either total caloric intake or total calcium intake has been a limiting factor in the

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on May 26, 1938.

² A definition of nutrition was then presented. This had been prepared as an introduction to a research carried out by Dr. S. Scougall, Dr. F. Marshall, Dr. Carr Fraser and Dr. Hansman, the scope and certain of the results of which are considered later in this paper. The definition illustrated the various factors that must be considered in a study of nutrition, and indicated that qualitative nutritional requirements were species-specific and quantitative requirements were individual.

development of the children studied, but that phosphorus may be. However, there is one difficulty in drawing the conclusion that development and intake of phosphorus are directly related, and that is that the phosphorus intake would be proportional to the first-class protein intake, because such foods are rich in phosphorus; so that it may be that our results demonstrate that growth is directly related to the first-class protein of the diet. Unfortunately, I can see no way of furthering our knowledge on this point. As far as practical feeding is concerned it does not matter, because so long as we see to it that there is adequate first-class protein in the diet, that is, meat, fish, eggs and milk, we shall ensure that development will be satisfactory.

There is, however, experimental evidence that phosphorus may be playing the part of a limiting factor in development. Sherman has shown that if growing rats have too little calcium in their diet, they grow normally but have light skeletons; if too little phosphorus is given, the animals remain stunted. Likewise, there is evidence from balance experiments on normal children conducted at the Royal Prince Alfred Hospital, in which, on a good diet, the intake and output of calcium and phosphorus were accurately measured, that there tended to be too little phosphorus but adequate calcium. In other words, it was easier to get a positive calcium balance than a positive phosphorus balance. Indeed there are many considerations that make one stress the point that phosphorus is more important than calcium. Our need for calcium is practically confined to the skeleton; over 99% of the calcium of the body is in the bones, and the total quantity of calcium outside the bones is very small. I have calculated from various data that the daily requirement of children is in the vicinity of 0.3 gramme of calcium a day, an amount that would be contained in 0.5 pint of milk a day. This figure is very different from Sherman's gramme of calcium a day; but there are various means of proving that this figure is far too high.

When we turn to phosphorus the story is entirely different. Large quantities of phosphorus are present outside the skeleton, for example, in muscle, in brain, in various organs, in the blood corpuscles *et cetera*. A good deal of phosphorus is required for adjusting the pH of the urine. The phosphorus used for this purpose is not inorganic phosphorus or phosphorus due for excretion, but organic phosphorus, which has to be broken down by an enzyme in the kidney for this specific purpose. Lastly, though practically all the calcium of the diet is available for assimilation, a good deal of the phosphorus is not.

We can now turn to consider certain other aspects of our study: first, the question of dental caries. I am often filled with wonder that we as a profession are so indifferent to a practically 100% incidence of dental caries in children of this city; and yet it is a preventable disease. To understand dental caries one must realize that the enamel which has

to be initially dissolved is an inert crystalline substance that receives no nutrition. Once the tooth has erupted, it is there for the rest of our life; it does not grow and it cannot be replaced like a nail or hair or other epidermal structure. The majority of teeth are quite normal when they erupt, as can be seen by looking at the beautiful pearls in the mouths of very young children. The only way these teeth are attacked is by acid produced by fermentation in the mouth. Carbohydrate is the only substance that can be fermented to produce acid strong enough to dissolve the enamel. The logical conclusion is that we must prevent carbohydrate from lodging and remaining in crypts and crevices of the teeth. The most efficient way of doing this is to insist on children's eating food such as hard fruits after their cakes or chocolates, and to educate them not to eat sticky sweets, such as caramels and toffees or soft biscuits. Food habits can be taught like any other habits, and, once formed, are difficult to break. I hope later speakers will touch on this problem of nutrition.

As regards vitamins, I consider that, taking the subject by and large, in this country the discovery of vitamins has benefited chiefly the manufacturing houses. Give a growing child a fairly mixed diet and you can disregard vitamins as we disregard salts, amino-acids and other essential substances that have not yet become good sales talk. There is one possible exception: it may be advantageous to give vitamin D during the first two years of life. The supplementary amount required, however, is small; and I am still to be convinced that lack of vitamin D in this country is the cause of rickets. That torch of hope that vitamin A and vitamin D would prevent infection has long since faded; indeed, it can be taken as axiomatic that no type of nutrition can confer immunity to infectious diseases. We can build up general resistance, but experience alone can develop specific immunity.

To me the problem of nutrition of the young organism is the problem of purchasing power. If the poor can afford to buy milk, meat, fruit and vegetables, the child's appetite will take adequate care of all else. The best things to eat are those synthesized by life's processes, and the more they are served in their natural form, the more nutritious they will be. The more we purify and cook and autoclave, the more we lose. Let the children eat from the garden and not from the tin.

If I were asked to give a list of foods for children, it would be the following. (The foods given are listed in order of merit.)

Milk.

Eggs, meat, fish, fruit, green vegetables, nuts, dried fruits, ice-cream, cheese.

Root vegetables.

Whole cereal products.

Tinned foods.

Bread.

Hard crisp sweets, boiled lollies *et cetera*, dry cakes. (Sticky sweets, sweet soft biscuits, soft chocolates.)

You will see that the worst foods are in general the most advertised.

Some may be disappointed with what I have said; but it appears to me that nutrition is an unusual problem. The science of nutrition is as complex as life itself. The practice of nutrition is simple, and is summed up by saying: "Eat what Nature provides."

PSYCHOLOGY, BABY HEALTH AND CHILD WELFARE.

By CEDRIC SWANTON, M.B., F.R.C.S.E., D.P.M.,
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It has been said, and with some degree of justification, that in the past we have given more intelligent thought to the rearing of chickens and prize pigs than we ever gave to the rearing of children. The parents, by virtue of their parentage, were supposed to know all about it. At the present time, however, this charge can no longer be levelled; conditioning and training are very much in vogue for infants and young children, and most people accuse other people's children of being "spoilt". Even ten years ago it was common to hear of the young mother's dilemma, trying to bring up baby scientifically and hurting grandmamma's feelings because she would not have him picked up, nursed *et cetera*. Nowadays it would seem that grandmamma and the old school have been defeated, and it is far commoner for the mother, occasionally yielding to necessity and her own feelings, to be told firmly by local experts that the child is being ruined. We have reached a stage when so many rules, theories and conditions of management are being discussed that the rearing of a child can become a nightmare of uncertainty for the conscientious mother.

All this, however, is progress, which lies in the fact of at least realizing that something was wrong, and in the attempt to put it right. But I cannot feel that, up to date, we have progressed nearly as far as we imagine in our knowledge of the real needs of young children.

It is a subject so profound and complicated and on which so much depends for the future of our race that one must approach it with considerable humility. Every generalization about children seems to have to be qualified, because every child is a different entity; and it is only for the sake of conciseness that I should dare to be at all dogmatic. Admittedly it is easier to hurl destructive criticism at some of the present ideas about children than to offer a new and better way; but nevertheless I shall attempt briefly to do both.

I find myself increasingly out of sympathy with the cut and dried systems of infant management and psychological education of older children offered so freely to the anxious mother of today. To begin with, there seems to be a general idea that training and conditioning and scientific feeding are sufficient for infants, but later on, when the child reaches a

more obviously complex state of development and gets out of hand, a little psychology should be thrown in. This I believe to be the fundamental error. If you want psychology at all, you must consider it from the moment of birth; for every piece of research and every clinical picture which goes deep enough points to the fact that infants are capable of the most complex emotional reactions and that the pattern for lifelong neurosis can be generated during the first year of life. That is briefly what I think has been overlooked by the modern baby experts, whose excellent ideas on the subject of feeding, routine and general hygiene can be completely nullified by the rigid manner in which some of baby's "good" habits are formed. On this subject I should like to say more later.

Significantly, it is the anxious mother, with her feeling of insecurity towards her children, who tries to satisfy her conscience by accepting some of the theories offered, and who sets such store on all the "musts" and "must nots" which this implies. This is well shown in some statistics compiled a few years ago in America. A follow-up of some hundreds of children who had been through the psychologist's hands led to the interesting conclusion that those whose parents had attempted to follow the psychologist's advice appeared on the whole to be less well adapted than those who had ignored it. I see in this the usual picture of over-anxiety defeating its own ends, in that the child of such parents is never left alone and inevitably absorbs the feeling of insecurity which is always bound up with parental fussing and anxiety; for if there is one positive fact which emerges more clearly than any other from the study of child and adult psychology, it is that the prime demand of every human being is for security—not for any special kind of security, but simply the achievement of that general feeling of stability of background which ultimately means feeling at home, so to speak, in the social structure. It is literally "at home" that this feeling must be found or lost in the first place. The practical problem then becomes one of looking for the best means of giving our children this vital feeling of security.

Training.

So much has been written authoritatively and dogmatically on conditioning and training the infant, so much conflicting psychology has been introduced into the discussion, and such divergent views have been expressed by everyone who thinks he understands children, that the laudable efforts of the various theorists have confused as many parents as they have helped. So worried indeed does the mother often become, without any clear-cut principles to guide her, or else with totally opposed ones as presented by different schools of thought, friends and relations, and so anxious is she not to do the wrong thing, that her natural vital interest in the child tends to weaken. This is the very worst thing that can happen in any mother-child relationship. Mothers, aunts, "in-laws" and even

husbands hurl half-baked psychology and scraps of infant welfare lore at her, well mixed with dogmatic ideas based on their own training and prejudices, most of which cut right across her instincts and rekindle her already existing anxiety. Thus, as the fortune-tellers say, the head often comes to rule the heart, and in this particular field it is vitally important that the heart, that is, the mother's instinctive bond with the child, should be felt and acted upon in as direct a manner as is compatible with our civilized life. It is easy to pour scorn upon the "maternal instinct" because it is sometimes so perverted as to be useless to the child. The fact remains that in most cases it is not seriously perverted and would often flare up much more positively if so many modern forces did not tend to damp it down. From the child's point of view it is better, I think, to have a calculable mishandling based on the mother's instinct and the consistent reactions of her own complexes, than a worried attempt to apply only half understood and often conflicting theories. One can picture, for instance, the dilemma of the mother trying to compromise between the habit or conditioning theories and the "no repression" psychology.

These two diverse and most widely propagated systems of infant and child management both seem to me only to touch the fringe of the child's real problem. The first, the conditioning system associated chiefly with the discoveries of the late Sir Truby King and his followers, is very attractive and plausible until you come to apply it—or rather until the mother tries to apply it. Competent nurses can do it beautifully because they believe in it and do not awaken the child's deeper emotions as the mother invariably does. Hence comes the old cry, "We can manage him perfectly until his mother comes along", generally implying some reflection on the mother's handling of the child. Actually I believe the baby has a right to have his deeper emotions stirred by the mother, and thrives in a much more vital way through his association with her than he can possibly do with any nurse. I do not see how any argument can get around this, which is not sentimental mother-talk, but biological fact.

This baby-training system, in some ways admirable, has been leapt at with enthusiasm for various reasons. First, it recognizes certain fundamental principles of regular feeding, modern hygiene, early bowel and bladder conditioning *et cetera*, all apparently sound ideas and for the best in the development of the baby. Secondly, if the conditioning is successful, it allows the mother very much more freedom and the time for outside pursuits so necessary in modern life. Thirdly, it has been responsible for the establishment of various centres for educating and assisting mothers in the care of their babies.

Unfortunately this and allied systems are becoming rigid and standardized, and, what is worse, they attempt to standardize children, to regulate them all in certain ways, like pieces of

machinery. Very often these enthusiasts cannot see the wood for the trees, and ignore the fact that the most perfect quantity of food given only at stated intervals, regular habits of bowel and bladder evacuation and correct quantities of sunshine and fresh air, are not by any means sufficient to produce a happy, healthy child; and in fact the severe training methods sometimes employed often produce an anxious unhappy child. Further, their ideas continue to be more and more elaborated, and in their exposition the word "should" is introduced to the endless distraction of the mother. At such-and-such an age a child should do this, should take that, should have a motion once a day after breakfast *et cetera*. If a baby refuses to fit itself into all these categories, then it is not suggested that the system is at fault, but only that the mother has not trained it properly, or has spoilt it.

I am quite sure that this over-elaboration was not originally intended. Sir Truby King laid stress in his book on the mother's showing common sense and flexibility in the application of his rules. Rigidity and even fanaticism are always apt to develop among disciples of a new creed.

To point out some of the dangers of this over-standardization one must refer once more to the fundamentals of child psychology. We must take into account the fact that each child is an individual with a complex instinctual emotional life of its own, that every child is different, though being endowed with the same instincts in varying proportions and degrees of intensity, and that always we must apply our theories very broadly, so that they may be sufficiently elastic to take into account all types and conditions of children and situations. Further, and this is very important, it is recognized and generally accepted that the pattern basis for neurosis is laid down in the early years of childhood, and our management of the child must aim at finding the best methods of feeding, hygiene, habit formation *et cetera* consistent with the establishment of a full and free emotional life. We must always be prepared to throw routine temporarily to the winds if the child is under any kind of physical or emotional strain. We recognize and make due allowance for physical difficulties, I think, but emotional strain so often takes the form of "naughtiness" that we feel compelled to treat it by disciplinary methods, which invariably make the condition worse. As I said before, the first and foremost demand of the child from the moment of birth is a demand for security. Hadfield has expounded a theory of tropism, or the demand of the newly separated organism for the proximity of some secure object. We see this in shell-fish clinging to the rock, the young mammal wanting the close proximity of its mother's body, and, as a later development of the same instinct, the individual's attachment to the herd. Hadfield has also pointed out the obvious anxiety which accompanies early separation from the secure object, from the simplest to the most complex forms of animal life.

This separation anxiety induced by a feeling of insecurity is the primary anxiety experience. The human infant shows this tropism in its first cry when separated from the mother, the cry which is instinctive and which in primitive conditions would be answered instinctively by the mother's clasping the baby in her arms. This demand for security, which is so obvious as to seem commonplace, is so often disregarded and overlaid by theories of hygiene that one must insist on it very strongly. So many children suffer from separation anxiety in various stages of development, anxiety about leaving the mother in the earliest years, and later about beginning school, going to new places, being independent *et cetera*, that it is of the first importance to see that as far as possible this demand for security is satisfied at its inception, and the associated anxiety appeased. This is the only way to avoid later separation anxiety. Unfortunately the modern advocates of good habits from the start do not recognize this fundamental fact. The mother knows but is often schooled to deny the fact that her instinct is to answer the baby's cry by picking it up and holding it close in her arms. We have all heard the story over and over again of how a mother's anxiety during the training of her infant has been so great that she has had to go out or have several doors between her and the noise when the nurse has insisted on letting baby "cry it out". This situation I believe to be entirely unnatural and unnecessary. It is a depressing prelude to motherhood for a young woman with her first child, teaching her to ignore her natural feelings and introducing a feeling of guilt if she ever allows these feelings to get the better of her. It takes a great deal of courage nowadays for a young mother to establish a really close relationship with her child. If she happens to be of the strongly maternal type she will have this courage and take no notice of her advisers. She will know that her job is to satisfy this fundamental demand for security by giving the child an unselfish, ungrudging, wholehearted love for just so long as he needs it, and by so doing she will satisfy not only the child but herself. Further, and just as important, she will also know when to let the child go, and never to cling as it reaches its various maturation stages of independence.

The first pleasures of an infant (and pleasure is absolutely essential to the healthy development of the child) are derived from sucking, warmth and close proximity to the mother's body or a very realistic substitute. It is these pleasures that allay the early separation anxiety and begin to build up its confidence in life. The withholding of these pleasurable sensations when the child feels its security is threatened, allowing it to cry itself blue in the face in the interests of habit training, will be apt to induce an anxiety which may be rekindled at any stage in life and may ultimately form the pattern for neurotic symptoms. Admittedly some infants can be readily trained into disregarding these deprivations and for a time become models of

conditioned routine behaviour. If this can be done easily and without strain, it is good for the peace of the household, but is of no great importance in the ultimate development of the child. But when the opposition to routine is strong and lusty, it is dangerous to persist; the most assertive and self-willed babies require the most indulgence, for the thwarting of their urgent needs only makes them more aggressive, and they will most likely grow into rebellious children with tantrums. It is essential to humour this type, show them much affection and never be afraid of "spoiling" them. The only thing you can "spoil" in them at this stage is their temper. It is far better to concentrate on making a baby happy and satisfied than on forcing him into certain categories of behaviour which are far beyond his capacity to achieve. When he is happy and satisfied he will become "good" without the slightest irritation either to him or his parents. It is time, I think, to stop talking about a baby's behaviour. A baby has no social "behaviour". It is a natural animal, which has not yet reached a stage of sufficient maturation for any serious degree of socialization to be attempted other than a very superficial conditioning for convenience. Regularity and routine have their importance only in that they tend to establish a rhythm in the baby's life, an absence of change which adds to its feeling of security. New faces, new places, sudden changes of food and routine tend to put a strain on young minds by stirring up feelings of insecurity and arousing separation anxiety. Therefore it is always good to try to establish regular habits, but never to worry when these habits break down, as they usually do during teething and other physical and emotional crises. It must always be remembered that conditioned habits are not rooted in the baby's will and intelligence, and mean nothing to it compared with its vital needs and emotions. Conditioning of bowel and bladder, for instance, is very convenient for the mother, but it matters very little in the long run and should be achieved only if it can be done without friction. The battle of the pot is a dangerous game for the child if the mother is anxious about the result, as she usually is if she thinks it worth a fight. Edward Glover believes that it is safer not to attempt any early bowel or bladder training at all; but it seems more natural to save a little washing if it can be done in a spirit free from anxiety, and if the mother can sportingly accept the setbacks that are bound to occur. Real sphincter control comes much later, when the problem settles itself more or less naturally. There seems to be some evidence to support the theory that it is settled more satisfactorily where the training has been lightest; and there also seems to be a correlation between later lack of control (mostly bed-wetting) and rigorous early training. However this may be, it is undoubtedly best to lay no stress on the matter at any stage, and never to punish an older child who is supposed to be clean for any kind of accident. This seems rather an obvious statement, but I am often appalled by the number of

mothers and nurses who smack their two-year-olds as a matter of course for wetting the carpet, and seem to be genuinely horrified at the crime. Someone very truly remarked that our first ideas of right and wrong are bound up with the sphincters.

Feeding.

Another important sphere in which I definitely believe in non-interference (as far as possible) is that of feeding. The baby health experts, on the other hand, believe in interference right from the beginning. It is worked out scientifically, and no doubt correctly, just what amount of food a baby, and later a young child, needs to keep it healthy and thriving. This would be an excellent idea, and I should recommend everyone to follow out the diet sheets if food were taken by injection rather than by mouth. But it so happens that the infant sucks and enjoys sucking as much as he will ever enjoy anything in his life—if he is allowed to. A certain amount of oral satisfaction is absolutely essential to the well-being and later to the healthy development of the child, and these modern theories seem based on the idea that the infant should have only a minimum of such pleasure. In some cases five feeds a day, each for twenty minutes by the clock, provide not only enough food, but enough oral satisfaction as well. But with many infants, though the intake of food may be sufficient for a gain in weight, it is not enough fully to satisfy its demand for oral pleasure. The infant therefore feels deprived and furious. In the bad old days he would have been given either a dummy or more breast to satisfy him, but now he must wait for the clock to strike, without being picked up, for fear of spoiling, and if in desperation he finds some consolation in sucking his fingers or a shawl, these are carefully and firmly removed from his mouth. If the finger-sucking becomes a habit some of the more zealous experts advise the tying up of hands so that the baby may be thwarted in his purpose. In my opinion some of these practices savour of the Spanish Inquisition. To witness the pathetic helpless rage of an infant and to be told that baby is only "trying on" is one of the crosses healthy-minded grandparents and others have to bear nowadays. I think it is far more important for baby's oral needs to be satisfied than that he should never have indigestion from over-eating. All young infants have "wind" and indigestion anyhow; so why not let them overeat naturally until they learn from experience not to? This is a lesson which is quickly learnt, and does not in the least mean that the baby will go on eating like a pig. I should like to know who said, and on what authority, that a baby should not use the nipple as a dummy, or should not go to sleep at the breast or with the bottle. This is a perfectly natural procedure and will add to the child's feeling of security and general sense of well-being. Again, there is no need to fear that the baby will get into a bad habit and never give it up. He will give it up naturally when his interest in the outside world becomes stronger than his interest in warmth and

sucking. The same may be said on this much-argued question of "picking up". A baby wants to be picked up for a variety of reasons. Only two or three of these are recognized as valid by the modern nurse. "Wind" in the stomach or bowel of very young infants, if audibly produced within a reasonable time after food, is regarded with a certain amount of sympathy and the baby is held for a while and given comforting pats on the back. Any obvious and outside hurt, such as a prick of a safety-pin, will enlist active sympathy from everyone. But a visceral stab unconnected with wind, which to the baby, with his undifferentiated sensations, may well be as sharp as a loose safety-pin, is apt to be looked upon rather coldly as a mere "try on" or naughtiness. If the baby just happens to feel lonely or hungry at the wrong time, if his careful wrappings do not give him the satisfaction for which he craves, the feel of a living human body, then he is definitely supposed to be "trying on" and is left to cry it out. The vital fact that his first cry of loneliness or apartness so often works up to fear and rage is ignored, and he is accused of showing naughtiness and temper, the implication being that to give in to his temper would be to spoil the child and ruin his moral fibre. This, to my mind, is utterly wrong and absurd. The child is not a vulture ready to spring upon any sign of weakness in his mother or nurse. He is a helpless creature in a new strange world with certain vital needs which only the mother can fully recognize and satisfy. The baby's health, physical and emotional, largely depends on the extent to which these vital needs are satisfied. It is a dangerous fallacy to argue that because some infants are satisfied with a certain amount of regular food and handling, the others are just being contrary when they keep on crying for more. They cry only because they need more; the system is at fault for these particular children. If they are humoured and picked up when they want it badly they will pass through this early fearful stage without harm, gradually coming to feel that the world is a safe place because the mother's arms are ready. And far from this wish to be picked up becoming a never-ending bad habit, it will soon come to pass that mother's arms are less and less in demand, and mother's face will be pushed very hard if she tries to nurse the child when activity on the floor seems more to be desired. In this matter, as in so much else, we can safely take the lead from the child.

The period of weaning, either from bottle or breast, is also one in which it is far better to make an open-minded approach instead of trying to apply a set of rigid theories. Susan Isaacs, who lectured here recently, and other eminent child psychologists, lay great stress on the importance of a slow weaning wherever it is possible. The transition from sucking to ordinary eating and drinking calls for a tremendous adaptation on the part of the child, and it takes place during a time when the added strain of teething is apt to set the child back from time to time. It is best to be

patient and not insistent when trying new types of food, and never to worry if the child refuses any kind of food at any given time. Meals can so easily become a strain, not to say a nightmare, if the mother has too many preconceived ideas of what the child should eat. It should never be forgotten that it is not only important what is eaten by the child, but how and in what spirit it is eaten. I have no doubt that a less good meal eaten happily and with relish does more for a child than a perfectly balanced repast forced on an unwilling child by an anxious mother. We see many instances of this in the relatively puny children who sometimes come from homes where every care is taken to give the child just what it is supposed to need and where no expense need be spared. It is far more common in this country for us to have to treat children with psychological feeding difficulties than those suffering from malnutrition from homes where good food is genuinely scarce. This is a problem which causes much anxiety in many homes; but I think it is mostly true to say that the problem need not arise at all unless the anxiety is preexistent. I do not think that a healthy breast-fed infant, slowly and gently weaned, would go far wrong in choosing its own diet if presented with a choice of ordinary suitable foods, particularly if nobody was ever perturbed when it refused its spinach. The creation of Popeye the Sailor, who does such wonderful things on spinach, is a recognition of the difficulty of persuading certain children to take certain foods which are supposed to be indispensable, and is a world-wide monument to the obsessionalism of the food fanatics.

Sleep.

Sleep is another matter on which we are inclined to be arbitrary. Babies obviously need a great deal of sleep, then progressively less and less until they need to sleep only at night. But one cannot usefully say that a child of a certain age needs so much sleep without coming up against exceptional children who seem actually to require less sleep than the average. Nothing at all will be gained by trying to force the requisite number of hours of sleep on these children, for the child's opposition will have a wearing effect on the mother and will add to its own store of resentment. Sleep, eating and excretory habits should be looked upon as natural functions and should have as little attention drawn to them as possible. Children are so quick to see the importance which the mother attaches to the daily sleep, the empty plate and the after-breakfast bowel action, that it becomes the easiest thing in the world to create a stir and to get back on the mother for some of her shortcomings by putting a spoke in the wheel of daily routine. All that the mother has to do to stop this reaction is to give the impression that to her it does not matter; she would like the child to do this or eat that, but if it does not want to, well it does not really matter—perhaps it will tomorrow or next week or even next year. The result of this attitude of bright

indifference is usually that the mother gets her way in the end, though often not until she has ceased to expect or desire it.

Leniency.

This advocacy of giving babies and young children almost their own way savours of our old friend the "no repression" psychology. In fact there is still, I believe, a popular idea that this is child psychology in a nutshell: let children do what they want, because if you do not they will be "repressed" and develop things called complexes. This is supposed to imply that if the child wishes to spill the ink on your best carpet, you dare not stop him, for evidently he needs to spill the ink in order to express himself and develop his personality. This jargon has almost gone out now; but some years ago it was still taken sufficiently seriously to lead to the formation of many "free" schools and other educational experiments, most of which, I understand, have had to be modified in order to make them workable. And so, as at every other school, these children are now "free" in some ways and disciplined in others, the only difference being in the quantity and quality of their freedom. Parents who became enthusiastic about this "new psychology" soon found themselves in fearful trouble, their natural impulses to curb and slap the child being at war with the supposed duty not to interfere. The drawback to this theory is a fundamental one: simply that it does not work and cannot be applied. The vexed parent who conscientiously leaves the child alone will inevitably take it out of the child in some other way, either by indirectly arousing a sense of guilt or by suddenly losing patience and making up for lost time with a good old-fashioned smacking or row. This type of parent therefore cannot fulfil the condition so highly rated by Crichton Miller, that of calculability. It is better for the parent consistently to show vexation when vexed, for the child then knows what it is up against and can achieve a certain security on a basis of solid fact. A child can so easily become insecure and fearful with an anxious, well-meaning parent whose attempts at self-control sometimes work and sometimes fail. This early psychology was undoubtedly based on sound psychological discoveries, and was certainly evolved in a spirit of reaction from the repressive tyranny which we suppose to have been practised by large numbers of Victorian parents and school-teachers. As a method of upbringing it has become more or less a laughing-stock and is largely discredited, but traces of it remain in our more humane general approach to children both at home and in school. Nevertheless I think the method has gone wrong in application far more than in theory, because I am convinced that we do repress in the wrong way and at the wrong age. Repression of some kind we obviously must have, in order to help our children to fit into the social fabric as it exists; but we are not sufficiently aware of the different stages of development through which children pass and of the fact that repression must

always be correlated with maturation. The practical difficulty, of course, is to know just when a child has matured to a point where one can repress or discipline in a certain direction with complete safety and a minimum of resistance. We cannot draw up reliable charts of maturation to tell us that a child of such-and-such an age should be so-and-so, because so frequently he is not. Children often become retarded in their emotional development and their ideas become fixed at an earlier age level. Therefore, in dealing with children we can only find out whether it is safe to insist by measuring the quality of the child's resistance. If the resistance is strong and loud, or resentful and scowling, then we do no good at any age by insisting on the child's compliance. If the infant struggles angrily to get away from the pot, or the young school-child throws a dirty look before suddenly breaking away from its game to go a message, then the answer is the same: the infant should be removed from the pot and the child relieved of its message—but not by the "Oh, very well, I'll get it myself" method. We could multiply these instances inexhaustibly and at the end one would almost inevitably be told: "But this is spoiling."

If there is one thing of which I am utterly and absolutely convinced, it is that giving in to children in the right way and at the right time is not spoiling, and I firmly believe that they need to be given in to far more than we have ever considered practicable. I do not mean that anything can ever be gained by self-consciously allowing the child to spill ink on the carpet *et cetera*, but that in certain vital matters connected with his deeper instinctual and emotional life we can interfere only at the child's peril. We must try to stop this habit of pulling against the child (beginning in infancy) for his own supposed good. "If he doesn't learn now, he will never learn" is utterly fallacious reasoning, also "He has to learn some time, therefore the sooner the better". We do not dream of trying to interfere with certain obvious stages of maturation, such as learning to walk and learning to talk, and the same principle should be applied in various other stages of psychological development. Ordinary school discipline, for instance, does no harm whatever to a normal child of, say, eight to ten years, unless the child responds emotionally to this discipline like a child of five. In such a case the discipline should be lifted immediately and the child treated with the utmost leniency until his sense of security is strong enough to enable him to respond like other children of his age. Instead of this, we are afraid to give in to the child for fear of "spoiling" him, and persist in repressive measures until the child makes a bad surface adjustment, or else reaches the point of breakdown, when perhaps the advice of a psychologist may be sought as a last resort. Judicious "spoiling" of an emotionally backward child is, I believe, the best possible form of treatment. The general effect of this is to make the child feel loved and wanted and secure, and when this feeling is achieved the problem is solved. A child

thus treated may act for a time in the traditional "spoilt" manner, that is, by making terrific demands on the parent and insisting fretfully on his own way in small matters. This, however, is only symbolic of the child's real need; for a spoilt child is at root a deprived child. We all know the fretful whining child whose parents apparently indulge every whim, and yet he presumes to be still unsatisfied. People turn with loathing from such a child; he is over-indulged, they say, and ought to be denied and spanked. Spanking will, however, only confirm the child's worst fears, that he is unloved and unwanted, whereas giving in lightly in trivial ways and constantly reassuring the child by showing him affection and appreciation will finally convince him that the world is safe and that there is no need to keep on nagging for these small tokens of reassurance.

We are not such founts of wisdom, prejudiced as we all are by our own complexes, that we can presume to say with any certainty what is for the child's ultimate good. It is best, therefore, constantly to be taking a lead from the child himself, who knows far better than we do what he really needs. Unfortunately we are seldom able to draw obvious conclusions from what we see, as our minds are so distorted by other people's theories and our own complexes. None the less, I think that most parents, who, in spite of surface irritations, are vitally concerned with the welfare of their children, would find it a positive relief to "spoil" them in a natural warm-hearted way if they were convinced that the need for spoiling would soon be outgrown. When a child is satisfied and secure in his background he ceases to make demands on his parents, and slowly and inevitably matures towards complete self-reliance and independence. Spoiling in the true sense of the word takes place only when the child is indulged selfishly, that is, when the pampering is used as a means of keeping the child emotionally tied to his parents for too long, after he should naturally have grown beyond the stage of dependence. The parent's rôle, particularly the mother's, is a difficult one, giving out wholeheartedly to the child when he makes demands, and standing back when he ceases to make them. Above all, a parent should never demand anything in return. The reward for the parents, and it should be enough, lies in the effective healthy maturation of the child.

This fact of gradual maturation is very clearly recognized; but unfortunately it is too rigidly worked out. From early infancy wise grown-ups tell us what the child should be and do at a particular age, and any falling short tends to ruffle the vanity of the parents; and this ruffled vanity comes out as a loss of patience with the child. The parents often fall into a sort of panic and decide that the child must be forced to do what is supposed to be fit and proper for his age. In this way incalculable harm is done. The child is strained beyond his present capacity and, far from being strengthened by compulsion, he almost certainly loses confidence in him-

ILLUSTRATIONS TO THE ARTICLE BY DR. E. GRAEME ROBERTSON.

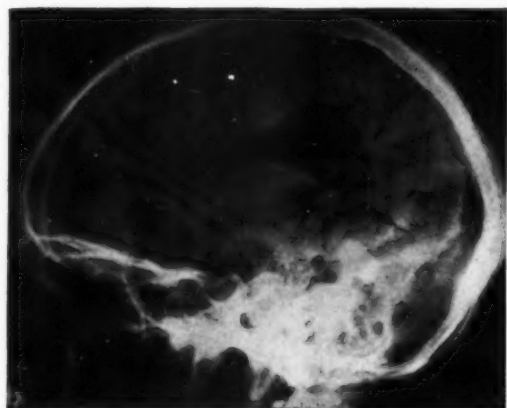


FIGURE 1A.

Skiagram taken after twenty cubic centimetres of air had been introduced by the lumbar route. Lateral view, patient erect. The body of the left lateral ventricle appears normal. On the right side the air has accumulated in the localized diverticulum.



FIGURE 1B.

Skiagram taken after twenty cubic centimetres of air had been introduced by the lumbar route. Lateral view, patient lying, right side of skull uppermost. The whole of the right ventricle, with the diverticulum, is well shown.

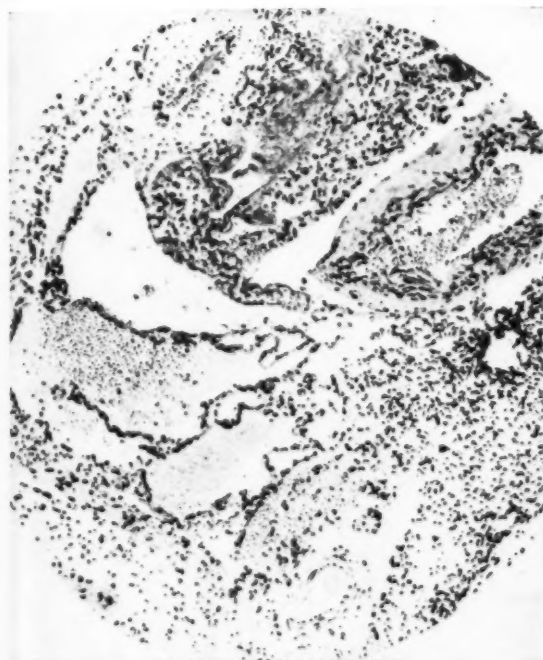


FIGURE 11IA.

Photomicrograph of the blood vessels embedded in the thickened pia-arachnoid. (Stained with haematoxylin and eosin.)

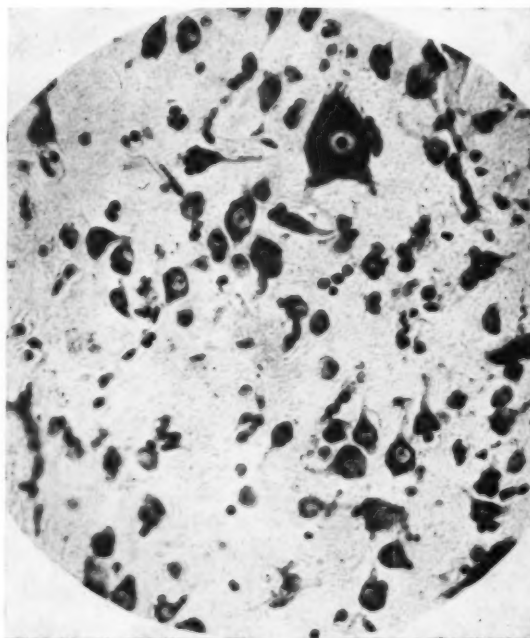


FIGURE 11IB.

Photomicrograph of the neurones underlying the angioma. (Nissl stain.)

ILLUSTRATIONS TO THE ARTICLE BY DR. REGINALD WEBSTER.

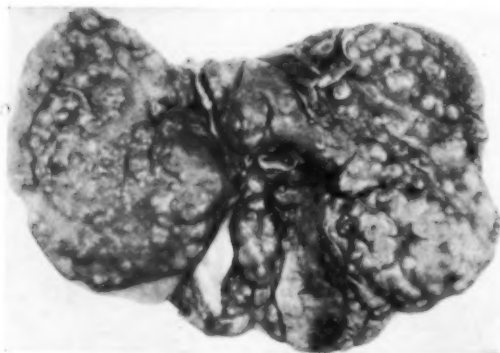


FIGURE XIII.

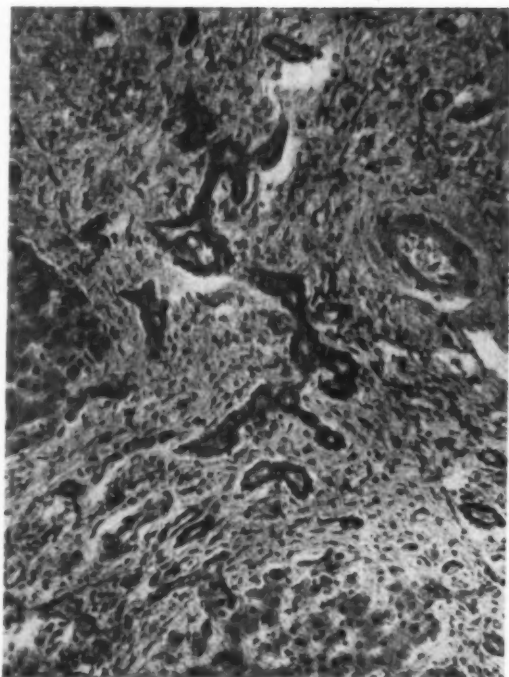


FIGURE XIV.
Infective cirrhosis. Cellular infiltration of portal tract;
apparent multiplicity of bile ducts.

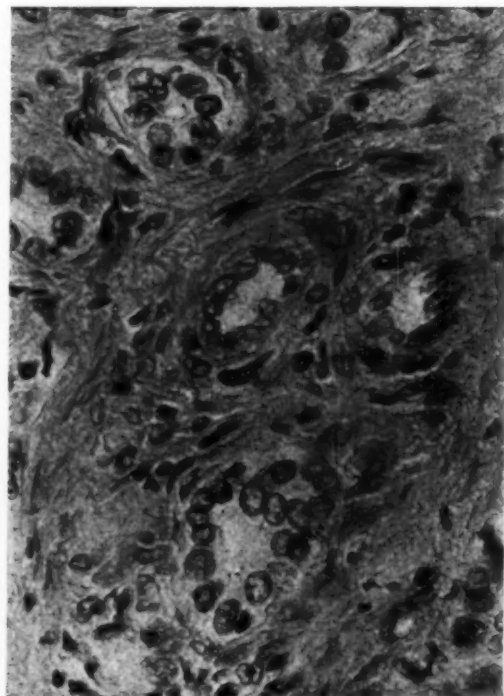


FIGURE XV.
Infective cirrhosis: fibrotic stage. Appearance of "bile
duct adenoma".

self and his environment. Sensitive home-loving children, for instance, who are sent away to boarding-school to toughen them, are faced with the necessity of making an adjustment beyond their present capacity. They may often make the adjustment superficially after a period of storm and stress; but on a wider view they will almost certainly be weakened instead of toughened. Future situations calling for emotional adjustment will rekindle this feeling of inadequacy, and they may never develop the self-reliance and adaptive capacity of the normal adult. The over-sensitive child can be strengthened only by judiciously making much of him at home until his wings are ready to fly. When this stage is reached he will quite possibly be prepared to fly willingly and even eagerly to boarding-school.

I do not think that one can overstress the importance of not expecting too much of children. In judging what is best for them one should never fail to have due regard for their age and stage of development. It is healthy exercise to use faculties already developed, but harmful strain to try to call them out before maturation. Nowadays this principle is fairly widely recognized in the shape of intellectual development, and we have practically ceased to try to push intellectually backward children; but emotional backwardness is harder to recognize and is often treated as sheer perversity. I look forward to the time when a series of fairly reliable tests of emotional development, corresponding with present-day intelligence tests, will be evolved for the purpose of recognizing children who should receive special treatment at school because of emotional instability. In this way a great deal could be done in the way of prophylaxis against future overt neurotic manifestations.

Punishment.

One cannot emphasize too strongly the fact that no good whatever comes from punishment or any kind of repressive measure administered before the child is old enough to take it. An unreasonable punishment will only breed resentment, which, if the punishment is persisted in, as it often is by parents who find their child's conduct intolerable, will probably either produce a neurotic character or a spirit of rebellion. I do not by any means suggest that no child should be punished for anything, nor am I an advocate for no discipline. Punishments, I believe, should be light and well within the child's range of understanding, and if it is possible to manage a child or group of children without them, so much the better. In any case punishment should be reserved for reasonably tough, normal children. Discipline offered in the right way and at the right time, and especially to groups, I believe to be an excellent thing for the development of an orderly character, as it seems to enhance the child's self-respect. Ordinary school discipline enforced without bias or fuss is easy for children to understand, and acts as a relief from tension and a contribution to the feeling of security. So long as their tasks and routine are suitable to their age and develop-

ment, children like to know what they have to do and when to do it. If they do not submit fairly readily to the discipline imposed, it is a sign that too much is expected of them, and less rather than more discipline is the better line of treatment.

It is true that children are naturally resentful of frustration right from the moment of birth (witness the rage of the hungry infant when food is withheld); but when a certain confidence in life and in their own background has been established they can be frustrated without resentment if it is done reasonably and in the right manner.

Conclusions.

In all cases and at all ages it is better to err on the side of leniency. Spoiling in the conventional sense of giving in to a child leads to difficulties only when it is done as a kind of bribe for keeping the child back in his independent life, used as an excuse for clinging, so to speak. If you give a child, to the best of your ability and within reason, what he wants when he wants it, you will almost certainly find that his demands will decrease as time goes on and his independent life develops. I firmly believe that in this way we can best help our children in their difficult transition from natural infancy to civilized maturity. It is so easy to forget that ourselves and our children, one and all, are "born to one law, to another bound". After the first few years of life most of us learn, at least consciously, to accept the civilized order so completely that we seldom remember that it is not a natural one. And so, having forgotten the stages by which we so painfully achieved our greater or less degree of adult stability, we are unable to live through again and sympathize with these stages as they appear in our children. Rather do their difficulties rekindle our own earlier ones and produce anxiety, often panic; and therefore we tend frantically to pass on to them the same kind of repression and interference which we received at the hands of our own parents. This is an unconscious process and is nobody's fault. It is quite useless and unjust to rail at parents; for, having their children's interest truly at heart, they do their very best within the limits of their personal complexes and prejudices. But as things stand, the shortcomings of parents, together with hereditary factors which we cannot measure, do tend to produce large numbers of "problem children", some of them recognized as such, others passing unnoticed until they break down or become antisocial later on in life. In dealing with such children (the same as with adult neurotics) I have found that with all the variety of individual symptoms they have one thing in common—a sense of emotional deprivation, a feeling of being unwanted and unloved, on account of which they cherish a deep and bitter resentment, either conscious or unconscious. Sometimes this feeling does not exist on the surface of the mind; but sooner or later it always comes out. It is therefore an obvious corollary to look for the best means of prevention. And personally I have no hesitation in suggesting

self and his environment. Sensitive home-loving children, for instance, who are sent away to boarding-school to toughen them, are faced with the necessity of making an adjustment beyond their present capacity. They may often make the adjustment superficially after a period of storm and stress; but on a wider view they will almost certainly be weakened instead of toughened. Future situations calling for emotional adjustment will rekindle this feeling of inadequacy, and they may never develop the self-reliance and adaptive capacity of the normal adult. The over-sensitive child can be strengthened only by judiciously making much of him at home until his wings are ready to fly. When this stage is reached he will quite possibly be prepared to fly willingly and even eagerly to boarding-school.

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It is true that children are naturally resentful of frustration right from the moment of birth (witness the rage of the hungry infant when food is withheld); but when a certain confidence in life and in their own background has been established they can be frustrated without resentment if it is done reasonably and in the right manner.

Conclusions.

In all cases and at all ages it is better to err on the side of leniency. Spoiling in the conventional sense of giving in to a child leads to difficulties only when it is done as a kind of bribe for keeping the child back in his independent life, used as an excuse for clinging, so to speak. If you give a child, to the best of your ability and within reason, what he wants when he wants it, you will almost certainly find that his demands will decrease as time goes on and his independent life develops. I firmly believe that in this way we can best help our children in their difficult transition from natural infancy to civilized maturity. It is so easy to forget that ourselves and our children, one and all, are "born to one law, to another bound". After the first few years of life most of us learn, at least consciously, to accept the civilized order so completely that we seldom remember that it is not a natural one. And so, having forgotten the stages by which we so painfully achieved our greater or less degree of adult stability, we are unable to live through again and sympathize with these stages as they appear in our children. Rather do their difficulties rekindle our own earlier ones and produce anxiety, often panic; and therefore we tend frantically to pass on to them the same kind of repression and interference which we received at the hands of our own parents. This is an unconscious process and is nobody's fault. It is quite useless and unjust to rail at parents; for, having their children's interest truly at heart, they do their very best within the limits of their personal complexes and prejudices. But as things stand, the shortcomings of parents, together with hereditary factors which we cannot measure, do tend to produce large numbers of "problem children", some of them recognized as such, others passing unnoticed until they break down or become antisocial later on in life. In dealing with such children (the same as with adult neurotics) I have found that with all the variety of individual symptoms they have one thing in common—a sense of emotional deprivation, a feeling of being unwanted and unloved, on account of which they cherish a deep and bitter resentment, either conscious or unconscious. Sometimes this feeling does not exist on the surface of the mind; but sooner or later it always comes out. It is therefore an obvious corollary to look for the best means of prevention. And personally I have no hesitation in suggesting

a general line for parents to take, both as prophylaxis and cure: to try to give children love and appreciation in abundance and to take less seriously these fears of indulgence and spoiling.

For psychologists, approaching the matter more scientifically, the pressing need seems to be a deeper and more searching inquiry into what have been called the "problems and ways of growth".

THE PROBLEM OF THE PARTIALLY SIGHTED.

By SIR JAMES BARRETT,
Melbourne.

THE Royal Victorian Institute for the Blind has, as a matter of abstract justice, paid inmates the difference between what they earn and the basic wage. The intention was admirable; but human nature has as usual asserted itself, and many people who are not blind have pressed for admittance, evidently seeking a secure position and defined wages. With any slackness the institute would have been overwhelmed and rendered insolvent.

It is obvious that it is necessary to define blindness and also partial sightedness; and the standard adopted is that which the British Government has been forced to adopt. This is as follows.

Those who are unable to count fingers at a distance of one metre are totally blind; those with vision up to $\frac{3}{60}$ are partially sighted; and those with vision between $\frac{3}{60}$ and $\frac{6}{60}$ are considered in association with the other evidence, such as contracted fields, nystagmus *et cetera*. Patients with vision better than $\frac{6}{60}$ are sometimes admitted to the institute; for example, when they are suffering from *retinitis pigmentosa* with tubular vision, or when blindness is inevitable fairly soon.

Payment to the partially sighted is left to the discretion of the Board, which is guided by the

oculist's report. The partially sighted assert in some cases that the sight they possess is of no benefit in their work. In the institute at present the totally blind and the partially sighted are approximately equal in number.

Special classes for the partially sighted are in existence in Great Britain; and the absence of training in Victoria for those with partial sight above the standard is a misfortune and should be rectified.

A very good example of success in such a case is afforded by a patient of mine, an albino, with vision of $\frac{1}{60}$ in each eye and nystagmus, who was brought up on a farm and has managed it successfully.

It is obvious that women with such vision could be trained to do useful domestic work.

Considerable pressure has been brought to bear to secure the admission to the institute of those above the standard, some of whom have excellent vision. If they had been admitted the institution might well have been brought to ruin.

Reviewing the heavy expenditure due to the humane system adopted, of paying the blind the difference between what they earn and a living wage, and the constant attempt to secure the benefits for those who are above the standard, I am reminded of the observation of the late Professor Huxley. Paraphrased, he stated that when in social matters we seek to make beneficial changes we can be certain of two results: (i) that when the effort has been made we shall not be in the position we were in at the outset, and (ii) that we shall not be in the precise position we expected to be when the change has been effected.

In other words, unless we possess an unusual gift of prophecy, human nature will assert itself in some unexpected fashion.

The following table of cases rejected by the institute illustrates the position.

Some Applications for Admission to the Royal Victorian Institute for the Blind during the Years 1932 to 1937.

Number.	Age in Years.	Nature of Defect.	Visual Acuity, With or Without Glasses.	
			Right.	Left.
1	30	Myopia.	6/4.5 (1 letter).	6/5 (2 letters).
2	17	Hypermetropia and strabismus.	6/4.5 (3 letters).	< 6/60.
3	62	—	6/6.	Practically blind.
4	58	Right eye excised.	Excised.	6/6 and normal field.
5	44	Left eye excised.	6/6 (normal field).	Excised.
6	7	Left eye blind from injury.	6/6.	Blind.
7	20	Epilepsy myopia.	6/9 (3 letters).	6/18.
8	30	Injury to right eye.	Shadows.	6/9.
9	8	Myopia.	6/12.	6/12 (1 letter).
10	20	High myopia.	6/12 (2 letters).	6/12 (3 letters).
11	27	Myopia.	6/12.	6/18.
12	34	High hypermetropia and astigmatism.	6/18.	6/18.
13	44	Right detachment. High hypermetropia.	6/18.	6/18.
14	15	High myopia.	6/18.	6/18.
15	23	Myopic astigmatism.	6/18.	6/18.
16	13	High hypermetropia and internal strabismus.	6/36 (1 letter).	6/18 (3 letters).
17	36	Trachoma.	6/24.	6/18 (2 letters).
18	34	Right eye excised. Buphthalmos.	—	6/18 (3 letters).
19	32	Left eye excised. High myopia.	6/24.	Excised.
20	16	Right eye absent.	Absent.	6/24 (2 letters).
21	17	High myopia.	6/60.	6/24.
22	14	High myopia.	6/36.	6/36 (1 letter).
23	13	Albino.	6/60.	6/36.
24	58	Shrunken globe, right eye; high hypermetropia, left eye.	—	6/36.
25	19	Congenital cataract.	6/36.	1.5/60.
26	49	High myopia.	6/36.	0.5/60.
27	14	Nystagmus.	6/36.	6/60.
28	16	Albino—nystagmus.	6/60.	6/36 (1 letter).

SOME RECENT ADVANCES IN PHYSICAL THERAPY.

By E. P. DARE, M.C., M.B., Ch.M.,
Katoomba, New South Wales.

THE notes for this article were made while I was visiting the physical therapy departments of thirty American hospitals. I met with the greatest kindness and helpfulness, every effort being made to show me whatever I wished to see, and to collect for me any statistics which were necessary.

To avoid confusion in referring to the different types of apparatus I have used a simplified nomenclature.

1. "Diathermy" means the long-wave type of machine.

2. "Inductotherm" means any apparatus which heats by electromagnetic induction.

3. "Short wave apparatus" means the condenser field kind of apparatus.

4. "Infra-red lamp" includes the burner giving a pure infra-red ray and the lamp giving the combined infra-red and luminous ray.

A very much greater use is made of physical therapy in America than is customary in Australian hospitals; but I am convinced that the results, both in the saving of pain and the cutting short of illness, demand that we shall carefully consider the more elaborate methods employed there.

Infra-Red Radiation.

Every patient who is to have massage or gentle manipulation of joints is given a preliminary treatment with infra-red rays for the purpose of relaxing the tissues and securing a greatly increased blood supply. It is generally accepted that the extra time and trouble are justified by the improved results.

Infra-red therapy is widely used after operation for the relief of surgical shock and pain. It is found that less morphine is needed, and after abdominal operations there is less tendency to ileus and retention of urine. It is widely used also as a preliminary to general ultra-violet radiation, the reason being that the chemical effect of the ultra-violet rays is increased by the hyperæmia of the skin.

Ultra-Violet Radiation.

Ultra-violet radiation is widely used for its "tonic" effect on patients weakened by long illness, either medical or surgical, and appears to be more effective than the older methods. It is also used in the delayed union of fractures, often in conjunction with the local application of heat by infra-red, inductotherm or short-wave apparatus. It appears to be very effective, applied by a "cold" quartz lamp, in considerably hastening the healing of sinuses affected with chronic suppuration.

The Inductotherm.

Besides its generally accepted uses, the inductotherm is being employed in the treatment of lobar pneumonia with very promising results. It is high time that some of our more enterprising physicians with beds in the great metropolitan hospitals investigated its effects. Schmidt, of Garfield Park Community Hospital, Chicago, has worked out a very thorough technique.

Passive Vascular Exerciser.

The passive vascular exerciser is a large "boot" into which the arm or leg to be treated is put. A soft rubber cuff fits firmly round the proximal part of the limb; pressure and exhaust pumps apply alternately increased air pressure and suction to the limb; alternation in pressure occurs as a rule about four times per minute. It is accepted as of great use in occlusive vascular diseases, especially in the early stages. In some hospitals it is also being used in acute cellulitis, lymphangitis and moist gangrene.

Whirlpool Bath.

The whirlpool bath, for arm or leg, is used largely in the treatment of arthritis and injury to joints. The bath is cylindrical, and a pipe enters it at a tangent. The limb is put in the bath full of water at about body temperature; more water is forced in under pressure to create a vigorous whirlpool effect, while the temperature is steadily raised to about 46.1° C. (115° F.), so that the limb is at once heated and massaged.

Elliott Treatment.

A number of physiotherapists prefer the Elliott treatment to either the inductotherm or diathermy for heating the pelvic organs. It does not seem to be as generally accepted as any of the other methods of treatment just described. It is given by means of a bag which is inserted into either rectum or vagina; the bag is distended with hot water, which circulates while the temperature is steadily raised to about 46.1° C. (115° F.). About one hour's treatment per day is administered, and those who use it declare that great benefit is given to women suffering from pelvic inflammation.

Fever Therapy.

Fever therapy is regarded as an essential part of treatment in every large hospital, yet there is not a fever cabinet in any general hospital in Sydney.

So far its chief value appears to be in the treatment of the following:

1. *Syphilis of the Central Nervous System.*—Its use in the treatment of syphilis of the central nervous system is widely known and needs no comment.

2. *All Gonococcal Infections.*—It would appear to be nearly a specific in the treatment of gonococcal infections. The methods vary a good deal, many workers giving the treatment two or three times at intervals of three days, raising the temperature to about 41.5° C. (106.7° F.) and maintaining it for six to eight hours. This technique claims to give about 90% of cures with the one course. The workers in the Strong Memorial Hospital, Rochester, New York, seem to me to be attacking the problem in the most scientific way. In each case a culture of the gonococcus is grown, the "thermal death time" of the culture at 41.5° C. (106.7° F.) is accurately determined, and the appropriate length of fever treatment is then given. In the strains so far studied the thermal death time varies from four to thirty-four hours.

3. *Chorea Minor.*—Children suffering from *chorea minor* stand the necessary fever treatment very well, and the relief is dramatic.

4. *Chronic Arthritis of Infective Origin.*—Investigators who used fever therapy in the treatment of chronic infective arthritis only claimed for the method that the results were promising, and justified them in believing that it was probably of more value than any other single form of treatment.

Other Conditions.—In two other diseases investigations have only just begun. A few patients with encephalitis have been treated; the results justify further work. At the Strong Memorial Hospital eight lepers have been treated. All have had complete remission of all signs of disease for varying periods up to two years. Two of the staff recently returned from Costa Rica, where they are trying to arrange to establish a clinic for a full investigation of fever therapy in leprosy.

Although there is complete agreement on the main uses of artificial fever, opinion about the best apparatus for producing it is still very varied. There are four main types of apparatus (dismissing the various fever-bags as now outmoded): (i) "The General Electric Fever Cabinet" (heat is generated in the body by the inductotherm); (ii) an infra-red type (heat is produced by a number of lamps in the roof of the cabinet); (iii) the short-wave type; (iv) the Kettering apparatus, in which the body temperature is raised by the patient's being placed in an air-conditioned cabinet.

The bulk of opinion seemed to favour either the inductotherm or infra-red type; but the question is far from answered. There seems to be a good deal of evidence, however, that the short-wave cabinet is more likely to cause severe burns than any of the others, and that the Kettering, when used for long periods at high temperatures, is more prone than the other types to upset the heat-regulating mechanism of the body.

The Therapeutic Pool.

The therapeutic pool is used in the treatment of spastic paralysis, infantile paralysis, and rigidity

of joints from varying causes; it is used also for beginning exercise in patients who are recovering from cardiac disease. It is generally preferred to the Hubbard tank for older children and adults, as one technician can supervise the treatment of several patients.

One difficulty, of course, is that the technician can work in the pool for short sessions only, as otherwise the skin becomes macerated. Waterproof overalls do not solve the problem, because of profuse sweating.

Discussion.

Work in physical therapy is greatly helped in America by the Council for Physiotherapy, a body acting with the authority of the American Medical Association, which investigates and pronounces upon the usefulness (or otherwise) of all apparatus put on the market. Hospitals that wish it are also given detailed advice about what physical therapy apparatus to install to provide for the most efficient treatment of all the kinds of disease and injury with which they usually deal.

These services would be of great value here, and should be established in due course, when there are men available with sufficient knowledge.

I should like to note the electrotherapy equipment of Dr. George Crile's hospital (The Cleveland Clinic). This hospital has 250 beds, and its equipment for physical therapy is as follows:

Diathermy apparatus	2
Inductotherm	3
Short-wave apparatus	1
Infra-red apparatus	15
Infra-red cabinet	1
Ultra-violet lamp (air-cooled)	3
Ultra-violet lamp (water-cooled)	1
Ultra-violet lamp (cold light)	1
Bristow coil	1
Fever cabinet	2

The staff of this hospital consists of one full-time director, four technicians and one student (in fever).

It may appear extravagant, but it must be remembered that all massage is preceded by infra-red radiation; that diathermy (Crile still prefers it to infra-red therapy) is largely used after operation; that general ultra-violet radiation is given to all debilitated patients, and the cold light is given in all chronic suppurative conditions of the sinuses; that heat (inductotherm, infra-red or short-wave, according to indication) is used in all cases of fibrositis, neuritis, sciatica, pleurisy, arthritis *et cetera*, and that many kinds of syphilitic and gonococcal infections are treated by means of the fever cabinet. Surely it will be granted that neither equipment nor time should be spared in the attempt to relieve pain and shorten sickness.

Reports of Cases.

A CASE OF VENOUS ANGIOMA OF THE CEREBRAL CORTEX.¹

By E. GRAEME ROBERTSON, M.D., M.R.C.P.,
Melbourne.

M.L., a man, aged thirty-one years, was admitted to the Austin Hospital under the care of Dr. Bell Ferguson, having been referred from the Tuberculosis Bureau. The patient is the fourth of a family of eight, the remaining seven being healthy. His mother's labour at the time of his birth lasted twenty hours; there was no medical assistance at this confinement. The patient appeared to be normal at and after birth, and no difficulty was experienced in rearing him. He sat up at eight months. When twelve months old he was said to have sustained a head injury. He was found crying in a runaway perambulator, the swift downhill course of which had been interrupted by a tree. When he commenced to walk, at twenty months, weakness of the left leg and "floppiness" of the left arm were first noticed. A week after he had taken his first steps he commenced to suffer from paroxysms in which he lost consciousness and convulsive movements spread from the left arm to the left leg and the left side of the face. For two months he made no further attempts at walking. His intelligence appeared to be normal, although he was not quite as advanced as his brothers. When he was fourteen years old he was top of the sixth grade at school.

The paroxysms continued with varying frequency. He usually had ten or twelve convulsive seizures in a week, although on occasions he had as many as thirty in a day, and in one period of *status epilepticus* he was unconscious for a week. Sometimes, however, he was well for months, the longest period of freedom being two years. The weakness of the left arm and leg was gradually progressive, being worse, however, after a long succession of fits. In his early years no warning preceded the loss of consciousness; but since the age of fourteen years a very uncomfortable sensory aura had always been present. A sensation of numbness appeared "over the heart" and rapidly spread up the left side of the chest, down the arm to the hand and over the left side of the face and head; the left arm became elevated and painfully flexed at the elbow; his head then seemed to spin round, the numb feeling pervaded his whole body, his knees gave way underneath him and he lost consciousness. His mother stated that the left arm began to twitch at this stage and the convulsion spread to his left lower limb and his mouth, the twitching being always most violent on the left side of the face. After recovering consciousness he usually felt severe headache over the right parietal region. The patient also suffered from pulmonary tuberculosis.

On examination the cranial nerves were found to be normal. The visual fields were full. The left limbs were smaller than the right; for example, the left lower limb was 3.75 centimetres (one and a half inches) shorter and the circumference of the calf 3.1 centimetres (one and a quarter inches) less than on the left side. Some degree of permanent flexion of the right elbow and gross club-foot were present. The motor power was reduced at the left shoulder, especially in flexion and abduction, and at the left elbow, especially in extension. The left wrist and fingers were permanently flexed, extension being very weak, and the intrinsic muscles of the hand were very weak. Flexion and abduction of the left hip and flexion of the left knee were slightly reduced; the ankle and toes were immobile. There was a slight increase in the tone of the flexor muscles of the left upper limb and in the extensors in the lower limb. The deep reflexes, except the ankle jerk, were slightly increased on the left side,

the abdominal reflexes were present and equal, the left plantar response was extensor, the right flexor. Sensation to light touch, pin-prick and changes in temperature was normal. Ability of distinguishing between single and double contacts and of localizing contacts was unimpaired. He was able to appreciate the direction of slow movements of his left great toe, but this appreciation was slightly impaired in regard to the fingers. Stereognosis was not as accurate in the left hand as in the right; although recognizing a two-shilling piece as a coin, he called it first a sixpence and then a shilling. Intelligence tests revealed only slowness and inaccuracy of mental arithmetic and a slight defect of memory.

X ray examination revealed pronounced asymmetry of the skull, the right side being less capacious than the left. On September 20, 1937, the cerebral ventricles were outlined by twenty cubic centimetres of air introduced by the lumbar route. X ray films then showed a localized diverticulum extending upwards and outwards from the posterior third of the body of the right lateral ventricle (Figure I). Axial views revealed displacement of the whole ventricular system, including the anterior part of the third ventricle, towards the right. The cerebro-spinal fluid was under a normal pressure (level of the fourth cervical vertebra in the sitting posture). It was clear and colourless, contained no cells and 0.05% of protein. Globulin was not increased. There was no reaction to the Wassermann test.

In view of the sequence of supposed head injury and epilepsy with a ventricular diverticulum well situated to explain the sensory Jacksonian phenomena, it appeared most likely that an area of cortical atrophy, consequent upon cerebral contusion, was the underlying organic cause of the epilepsy. It was obvious, however, that the cortical abnormality was of greater extent than the area over the diverticulum; for the right side of the skull was smaller than the left, the ventricles were displaced in this direction and the hemiplegic signs indicated involvement of the precentral gyrus. Yet, as the diverticulum corresponded to the focus of the attacks, it seemed reasonable to attempt to cure the epilepsy by excision of the overlying cortex.



FIGURE II.
Photograph of the right cerebral cortex as exposed at operation. (I am indebted to Dr. Hubert Smith for taking this photograph.)

On October 15 Dr. Hugh Trumble explored this area of the brain. In the posterior part of the parietal lobe, reaching to within four centimetres of the sagittal sinus, a plexus of veins, embedded in thickened pia-arachnoid, was seen to be overlying the cortex (Figure II). Explora-

¹The patient in this case was shown at a meeting of the Victorian Branch of the British Medical Association at the Austin Hospital on April 20, 1938.

tion with a needle proved that this area corresponded to the apex of the ventricular diverticulum, about one centimetre below the surface. By means of silk ligatures and silver clips the vessels running to this plexus were occluded and divided. The area of cortex superficial to the ventricle, measuring 4.0 centimetres by 3.0 centimetres, was then removed with the aid of an endotherm knife, the ventricle being widely opened. Evidence of abnormality of the surrounding brain was seen in the widened sulci containing pools of fluid.

After the operation the patient was unable to move the left arm or leg; but the power has gradually returned, so that six months after the operation he finds it slightly more difficult to walk than before. Apart from four fits in one morning, two months after the operation, he has been free from attacks. He and his mother are delighted with the result of the operation; but it is too early yet to judge of its efficacy. It is to be remembered that, when under a herbalist's care, he was free from attacks for two years. At the present time he cannot extend the fingers of the left hand without flexing the wrist. There is little difference in the power of the lower limb. The reflexes in the left arm are less active than before. There has been a gross increase in the discriminative sensory loss of the upper limb and pin-point feels blunter than on the right side. He cannot localize or distinguish between single and double contacts. He cannot appreciate the direction of movements of his fingers (although he can of the proximal joints) and on touch he now calls a coin a pencil. Appreciation of position and passive movement is still accurate in the lower limb, although localization and discrimination between single and double contacts are impaired here as over the left side of the trunk. These sensations are less impaired over the face than elsewhere.

Discussion.

It was expected that the excised tissue would prove to be a glial scar on microscopic examination; but this was not the case. Overlying the brain a number of large thin-walled veins were seen to be embedded in cellular fibrous tissue. There were also a few smaller vessels with thicker muscular walls containing an internal elastic lamina. No large vessels penetrated the cortex; but it contained rather more capillaries than usual. The cortex was packed with an abnormal number of neurones, completely lacking the usual architectural arrangement. The cells, although small, appeared to be healthy, and the Nissl granules were normal in the few larger cells present. The atrophy appeared to be at the expense of the white matter rather than the grey. The myelin stained normally. Glial staining revealed no gross abnormality of cells or fibres (Figures IIIA and IIIB). The microscopic structure therefore suggested that this was not a glial scar secondary to cerebral contusion.

Two other explanations are possible. An atrophic process of the right cerebral hemisphere, installed at an early age and most intense in a small area, is the least likely explanation. Near areas of cortical atrophy the cortical veins are often found to be large. The cortical cells, however, do not suggest an atrophy, but rather a process of condensation. The subsequent defect of sensation leaves little doubt that functioning cells were removed.

The more likely explanation is that the local vascular abnormality is a racemose venous angioma. The question of the origin of such angiomas has not been settled. Whether they are developmental anomalies or true neoplasms has long been the subject of discussion. It seems most probable that the first explanation is correct, although they may behave as tumours and are capable of subsequent alteration in size. If this explanation applies to this case, the angioma would appear to be a part of a more widespread developmental anomaly, accounting for malfunction of a large area of the cortex. Recorded cases of angiomas contain no mention of a localized ventricular diverticulum.

PATHOLOGICAL REPORTS FROM THE CHILDREN'S HOSPITAL, MELBOURNE.

By REGINALD WEBSTER, M.D., D.Sc.,
Pathologist to the Children's Hospital, Melbourne.

X. JUVENILE CIRRHOSIS OF THE LIVER (PORTAL CIRRHOSIS).

THE museum specimen chosen as the basis of the ensuing discussion was obtained at an autopsy which I performed on the body of a female child, aged seven years, who was admitted to the Children's Hospital on October 14, 1937, under the care of Dr. A. P. Derham. Jaundice, dyspnoea, cyanosis and a great degree of abdominal distension made admission to hospital for this little girl a matter of extreme urgency. She was observed to have a greatly enlarged spleen, but there was no apparent increase in the area of hepatic dulness. On October 16, 1937, 1,800 cubic centimetres of ascitic fluid were withdrawn by paracentesis abdominis, but within a week of her admission to hospital the child died of sudden and profuse hæmatemesis.

The salient, if not fundamental, feature of the girl's clinical history was that she was jaundiced at birth and remained so for nine months.

At the autopsy the liver exhibited an extreme degree of coarse cirrhosis, although the organ as a whole was small—a typical atrophic, multilobular cirrhosis of Laennec. Depressed patches of atrophy and cicatricial contraction had produced a coarsely knobby liver. In the cut surface broad bands of fibrous tissue could be seen encircling groups of lobules, in many of which compensatory hyperplasia of the hepatic parenchyma had occurred, with the production of the so-called "cirrhotic adenoma".

The biliary passages were isolated and explored, but there was no evidence of any degree of obstruction to the principal bile ducts. Probes passed easily through the hepatic ducts and common bile duct.

The spleen was greatly enlarged, being at least four times its normal size. This viscus displayed no capsular opacities, but in section the capsule appeared rather thickened and there was definite excess of fibrous stroma in the spleen.

The stomach contained a small quantity of blood; and although the veins at the cardiac end were very dilated, no focal point of hæmorrhage could be discerned in the mucous membrane of either stomach or duodenum. There was much altered blood in the small intestine, the mucous membrane of which, after being washed, showed no recognizable lesions.

To record the cause of death in this child as cirrhosis of the liver in no way elucidates the pathology of her condition; in fact, it does nothing more than give a name to the end-result of a process, the origin of which has given rise to much conjecture.

Cirrhosis of the liver of this type and extent is referable to a chronic and progressive diffuse hepatitis, of which it is the ultimate evolution. In discussing the operation of the laws of Colles and of Profeta in congenital syphilis, Sir Harry Allen was wont to say that syphilis in the child implied syphilis of the mother as a necessity. One might paraphrase this dictum of our late distinguished dean of the faculty, and apply it to the subject now under discussion by saying that cirrhosis of the liver implies chronic hepatitis as a necessity.

From a survey of clinical and experimental observations relating to ætiological factors in portal cirrhosis in general, it is plain that no single agent can be implicated. As contributing to the production of cirrhosis of the liver in the adult, vague and ill-defined bacterial and metabolic toxins have been invoked, supported by certain organic and inorganic poisons. Alcohol has been accorded a proverbial preeminence, but present-day opinion, based on experimental and clinical evidence, is that alcohol per

se does not induce cirrhosis of the liver, and the gin drinker thus loses his claim to hepatic distinction.

These remarks are merely by the way, the essential problem being to make some attempt to trace the origin of the condition of advanced cirrhosis which presented itself in this particular child.

The fact that she was jaundiced at birth and continued so for nine months is a cardinal point in the clinical history. The autopsy eliminated any possibility of congenital stenosis of the bile ducts as a factor underlying the neonatal icterus. In the *post mortem* room congenital syphilis obtruded itself as a somewhat obvious suggestion, which was not supported either by the serological evidence afforded by the Wassermann test or by subsequent histological findings.

John Thomson,⁽¹⁾ as long ago as 1908, described a type of infective jaundice in the new-born based on an acute hepatitis due to streptococcal infection from the umbilicus, and pointed out that there might be no external evidence of umbilical infection. Moon,⁽²⁾ writing in *The American Journal of the Medical Sciences*, reported two cases of cirrhosis of the liver in children which he regarded as of infective origin. One was that of a boy, aged twelve years, whose condition had been considered clinically as an example of Banti's disease. The spleen was much enlarged, and the liver, firm and nodular, presented a picture of atrophic cirrhosis. A section stained for bacteria showed cocci in pairs throughout the organ, but admittedly the autopsy was performed several hours after death.

The second patient whose case was recorded by Moon was a boy, aged fourteen years, who exhibited clinically anaemia, leucopenia, a slight degree of jaundice, ascites and an enlarged liver and spleen. A noteworthy feature was that several children of the family had already died of cirrhosis of the liver. At autopsy the liver was found to be of hobnail character, large and firm. Sections of the liver showed cocci in more recent areas of degeneration and necrosis, and a pure culture of *Streptococcus hemolyticus* was obtained from the liver *post mortem*.

In a discussion of these results MacMahon and Mallory⁽³⁾ point out that the attempt to ascribe chronic inflammatory lesions of the liver to streptococci acting locally is open to criticism, even when the organisms are demonstrable, on the ground that they might gain access to the liver in a terminal bacteriemia.

MacMahon and Mallory⁽³⁾ reported five cases of streptococcal hepatitis, two of which occurred in infants, which they considered could best be explained as the result of the actual presence of streptococci within the liver. They maintained that the inflammatory reaction and necrosis of liver cells so conspicuous in sections were due to the direct action of the toxins liberated by the microorganisms present in the lesions. Had the children overcome the infection and lived, the ultimate result would have been a cirrhosis corresponding to that so often seen after acute toxic hepatitis. At the same time the authors disclaimed any attempt to explain cirrhosis of the liver in its broad sense as a chronic or healed inflammatory lesion of infective origin.

V. H. Moon⁽²⁾ maintains firmly that chronic infection of the liver should be regarded as an important cause of cirrhosis. In the two cases of atrophic cirrhosis in children of school age in which he demonstrated streptococci in the liver, this worker found these microorganisms in the spleen also. The hemolytic streptococcus cultivated from the liver of one of the children was recovered from the liver in 11 out of 12 rabbits into which it was inoculated, and from the spleen in five of the animals. Infection of the liver in the rabbits occurred regardless of the route or site of the inoculation; and the recovery of the streptococcus from the spleen in five of the animals is an interesting observation, in view of the clinical evidence that juvenile cirrhosis is a spleno-hepatic disease rather than purely hepatic. The early and pronounced enlargement of the spleen in cirrhosis of the liver in children is a point of clinical difference between juvenile and adult cirrhosis.

Icterus Gravis Neonatorum.

The duration of the neonatal jaundice in this child amply justifies the consideration of her case as one of *icterus gravis neonatorum*, and perhaps the best approach to the elucidation of the sequence of events is to determine the pathological basis of *icterus gravis neonatorum* and to examine the possibility of such lesions leading eventually to cirrhosis of the liver. The current conception of *icterus gravis neonatorum* is that it is one manifestation of *erythroblastosis fetalis*, the other clinical expressions of *erythroblastosis* being *hydrops fetalis* and *anaemia hemolytica neonatorum*. The paramount histological feature of *icterus gravis*, which it shares with *hydrops fetalis* and to a less extent with hemolytic anaemia of the new-born, is the occurrence of widely distributed extramedullary hematopoiesis. Hawksley and Lightwood⁽⁴⁾ summarize the main clinical and pathological features of fetal erythroblastosis as: (i) hemolytic anaemia, (ii) a large excess of nucleated red cells in the blood, (iii) extensive extramedullary hematopoiesis, (iv) icterus, and (v) enlargement of the liver and spleen.

A number of cases are on record which suggest strongly on clinical grounds that *icterus gravis* may be a precursor of juvenile cirrhosis of the liver. For example, Braid and Ebbs⁽⁵⁾ report the case of a child which furnishes an exact parallel with that of the girl from whom the present specimen was obtained. Their patient was a female child who first came under observation in the neonatal period, suffering from *icterus gravis*, and died at the age of three and a half years from hematemesia due to multilobular cirrhosis of the liver.

Another example of the apparent association between *icterus gravis* and hepatic cirrhosis is furnished by the patient of C. C. Curtis,⁽⁶⁾ a girl, aged fourteen years, who died of hematemesia, and whose liver was found at autopsy to be uniformly nodular, well meriting the description of multilobular cirrhosis. Of this girl Curtis states that "she had a rather severe type of jaundice neonatorum, but it cleared perfectly".

Such clinical suggestions that at least one group of cases of juvenile cirrhosis of the liver may arise as sequelae of *icterus gravis* are supported by the pathological studies of Hawksley and Lightwood.⁽⁴⁾ These observers found evidence of hepatic fibrosis in seven out of nine subjects of *icterus gravis*, the livers of whom they were enabled to submit to histological study. They suggested that the process of recovery from *icterus gravis* was occasionally accompanied by cirrhotic changes.

There is thus both clinical and pathological evidence for the thesis that some at least of the instances of that etiologically obscure condition, juvenile cirrhosis of the liver, stand in sequential relationship to *icterus gravis neonatorum*.

And what lies behind the *icterus gravis*, or rather the fetal erythroblastosis of which it is one form of expression? Is the erythroblastic process provoked by the hemolysis, or is there a primary disease of the erythron to which the hemolysis is secondary? In the latter event an explanation for the hemolysis is found in the probability that the cells elaborated in the erythroblastic foci are abnormally prone to destruction. If the hemolysis comes first, the sudden demand for fresh cells, at a time when extramedullary fetal hematogenesis has barely ceased to function, may reactivate the fetal mechanism and determine the outpouring of nucleated red cells into the circulation.

Whichever of these views one chose to propound, he could quote chapter and verse from the literature of erythroblastosis in support of his argument; but were this problem elucidated, there would still be that of the underlying cause, either of the hemolysis or of the erythroblastosis. This remains an unsolved problem, the solution of which apparently does not lie in the direction of bacterial infection. Writers on the subject are forced back on the action of nebulous toxins as the only means of explaining the association of hemolysis, liver cell damage and nerve cell necrosis (kernicterus) in many of the cases.

In some informal discussions relating to the child whose liver has evoked this somewhat discursive commentary, I have remarked that it is not improbable that, had she been brought to hospital a year or two earlier, the enlarged spleen would have been the leading clinical feature and, as likely as not, she would have been subjected to splenectomy as suffering from splenic anaemia or Banti's disease. Consideration of her case recalls to me that of another girl, photomicrographs of whose liver I showed at a meeting of the Melbourne Paediatric Society, as reported in *THE MEDICAL JOURNAL OF AUSTRALIA* of September 25, 1937. Splenectomy was performed for this child, and at the operation Dr. H. Douglas Stephens secured a biopsy specimen of the liver. The microscopic sections, as I demonstrated from the photomicrographs, disclosed an advanced cirrhosis alongside the fibrocellular reaction of a chronic and progressive hepatitis.

The more one studies the question, the more it appears that the so-called Banti's disease is a collection of signs and symptoms rather than a disease entity with its own histo-pathological basis. Competent observers have shown that the histological changes in the spleen described by Banti can all be demonstrated in splenomegalies which have developed as a result of cirrhosis of the liver. As Boyd remarks in one of the many lighter touches which make his book on medical pathology so readable, splenic anaemia is "an omnibus term which has been made to carry too many passengers".

Would it not be better to discard the term "Banti's disease" and consider a group of hepato-splenic fibroses, in which, as the result of the action of some toxic agent, parenchymatous degeneration is followed by fibrosis, which commences at some times in the spleen, at others in the liver?

It is difficult to connect any recognized disease of the spleen with preceding *icterus gravis*, but the pathological studies of Hawksley and Lightwood¹⁰ demonstrate that fibrosis may result in the spleen in *icterus gravis*, as in the liver, though less often. If the proposal to regard splenic anaemia and Banti's disease as varieties of hepato-splenic cirrhosis is adopted, *icterus gravis neonatorum* might be the forerunner of some of the juvenile cases by damaging either the liver or the spleen, or both, thereby predisposing these viscera to subsequent inflammatory cirrhosis.

In conclusion, may I state that, although in the earlier portion of this essay I gave much consideration to cirrhosis of the liver in children as possibly a chronic infective process, I would present this particular specimen as an example of atrophic multilobular cirrhosis following *icterus gravis neonatorum*. That the erythroblastosis underlying *icterus gravis* is infective in origin is more than doubtful, but the damage which it occasions to the hepatic parenchyma may render the liver more vulnerable to infective and toxic agents.

The article by Hawksley and Lightwood,¹⁰ from which I have quoted, is an authoritative treatment of the general question of foetal erythroblastosis.

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- ¹ J. Thomson: Quoted by H. E. MacMahon and F. B. Mallory.
- ² V. H. Moon: "Infection as a Cause of Juvenile Cirrhosis". *The American Journal of the Medical Sciences*, Volume CLXXVII, 1929, page 681.
- ³ H. E. MacMahon and F. B. Mallory: "Streptococcus Hepatitis". *American Journal of Pathology*, Volume VII, Number 3, May, 1931, page 299.
- ⁴ J. C. Hawksley and R. Lightwood: "A Contribution to the Study of Erythroblastosis: Icterus Gravis Neonatorum". *The Quarterly Journal of Medicine*, Volume XXVII (New Series, Volume III), Number 10, April, 1934, page 155.
- ⁵ F. Braid and J. H. Ebbs: "Atrophic Cirrhosis of the Liver following Icterus Gravis Neonatorum". *Archives of Disease in Childhood*, Volume XII, December, 1937, page 339.
- ⁶ C. C. Curtis: "Juvenile Cirrhosis of the Liver". *Archives of Pediatrics*, Volume LI, 1934, page 396.

XI: JUVENILE CIRRHOSIS OF THE LIVER (BILIARY CIRRHOSIS).

My interest in the subject of infective cirrhosis in children, as distinguished from that associated with congenital obliteration of the bile ducts, was first excited by the autopsy findings in the case of a female infant, aged fourteen months, who was admitted to the Children's Hospital, Melbourne, on April 29, 1920. Five days prior to admission the baby, previously healthy, suffered a "feverish attack"; she continued febrile during the eight days which elapsed before she died, and exhibited as one definite feature in an otherwise obscure illness an enlarged liver, the edge of this organ being palpable at a distance of four centimetres below the costal margin. At no time was jaundice observed.

Dr. S. O. Cowen performed the autopsy and recorded that the liver was large, its surface smooth, its capsule slightly thickened, and its substance of distinctly tougher consistency than normal. The gall-bladder and bile ducts presented no abnormality, and particularly there was no obstruction to the flow of bile in the extrahepatic biliary system.

Dr. Cowen proceeded with the study of microscopic sections of this baby's liver, and we were both impressed by the apparent multiplicity of bile ducts. I remember advancing the suggestion of an adenoma of the bile ducts; but further study of the section made it clear that the process was not one of newgrowth. Eventually Dr. Cowen and I elaborated between us the descriptive term "subacute proliferative cholangitis". Under that title Dr. Cowen published the infant's case record and his own comments,¹¹ although we both felt that the word "proliferative" implied an assumption which it might be difficult to justify.

In his report to *THE MEDICAL JOURNAL OF AUSTRALIA* Dr. Cowen published a photomicrograph showing a distended bile duct, the lumen of which was completely filled with crowded polymorphonuclear and endothelial cells. Among the cells Dr. Cowen detected a clump of bacilli which failed to retain the stain in the Gram process of staining. The fibrous tissue in the portal tracts was also permeated with inflammatory cells; there was already fibroblastic reaction and the stage was set for the development of the condition described by Mallory¹² in 1911 as "infective cirrhosis".

Mallory defined the term "infective cirrhosis" as indicating a state of cirrhosis of the liver directly referable to the action of bacteria in the lesions. Although bacteria might reach the liver by direct continuity of tissue, via the hepatic artery, portal vein or bile ducts, it was only when the infecting microorganisms gained access by the bile ducts that a characteristic type of cirrhosis was induced.

Cirrhosis of the liver in which the bile ducts and supporting tissue of the portal tracts sustain the initial damage, whether such be occasioned by bacterial invasion or organic obstruction in the extrahepatic biliary system, is known conveniently as "biliary cirrhosis". At the moment the discussion is limited to the infective variety, and it seems reasonable to attribute the infection to microorganisms which have ascended the common bile duct from the alimentary tract.

The infant who was the subject of the case report published by Dr. Cowen had suffered from diarrhoea, and during her brief stay in hospital *Bacillus enteritidis* (Gärtner) was recovered from the stools. Unfortunately when bacteria were subsequently found "*in medias res*" in the bile ducts, it was too late to identify them any more precisely than as Gram-negative bacilli.

Following the activity of pathogenic bacteria in the bile passages, an inflammatory reaction is excited both within and without the smaller bile ducts. As the limits of the supporting tissue of the portal tracts are reached by the bacteria or their toxins, the hepatic cells at the periphery of the lobules suffer varying degrees of damage. The injury to the hepatic parenchyma, however, is not such a prominent feature as in portal cirrhosis, and as it is generally restricted to the cells at the periphery of the lobules the normal lobular architecture is preserved. In

the end is evolved a liver exhibiting a degree of enlargement which is as a rule not great, a smooth exterior, an unduly firm consistency, and a cut surface studded with small greyish areas representing the excess fibrous tissue in the portal tracts.

The microscopic lesions described by Dr. Cowen in the liver of the infant whose case served to introduce this discussion show clearly how the process of infective cirrhosis is initiated, and quite recently (December, 1937) there died at the Children's Hospital a child (Edith K.) in whom this process had attained its full development. This patient was a girl, aged eleven years, who was said to have suffered from repeated attacks of bronchitis ever since infancy, and during the period of her attendance at the Children's Hospital the diagnosis of bronchiectasis was established both clinically and radiographically.

The autopsy was carried out by Dr. V. L. Collins, who secured specimens for my subsequent investigation. It is impossible to exaggerate the deplorable condition to which the lungs were reduced and the offensiveness of the contents of the large bronchiectatic cavities.

The liver was enlarged, firm and smooth, with a rather sharp edge. Numerous greyish areas were observed studding the cut surface of the liver, and further investigation was based on the probability of the presence of amyloid disease. The hepatic tissue failed, however, to give the iodine reaction, and in microscopic sections no lardaceous deposit could be found in the walls of the arterioles. Instead, a condition of "biliary cirrhosis", with great increase in the fibrous tissue of the portal tracts and apparently innumerable bile ducts, was the striking feature of the histological picture (Figure XIV).

It is not difficult to suggest the manner in which the biliary system became infected in this girl when it is remembered that for several years at least she must have swallowed large amounts of particularly fetid sputum.

The increase in number of the bile ducts shown in the illustrations (Figures XIV and XV) is apparent rather than real, and it would seem necessary to withdraw the term "proliferative cholangitis" advanced by Dr. Cowen and myself in 1920. During the stage of active inflammation the smaller ducts, distended with inflammatory products, become stretched, elongated and tortuous; with the subsequent contraction of the newly formed fibrous tissue in the portal tracts the tortuosity of the ducts is enhanced, so that a cross-section in either phase gives an impression of greatly increased numbers.

In neither of the children so far considered was there any suggestion of stenosis of the bile ducts or other cause of biliary obstruction. Infective biliary cirrhosis in which there is no obstructive factor is stated by Mallory²⁰ and other writers to be of rare occurrence and to be more likely to be met with in children than in adult patients. The children to whom I have referred furnish the only two examples of non-obstructive infective ("biliary") cirrhosis of the liver that I can recollect from a now long experience in the pathology of diseases of children, so that I feel that I can subscribe to the statement that infective cirrhosis arises very infrequently.

In neither of these two children was jaundice observed at any time during the period of their observation at the Children's Hospital. This is a fact which it is somewhat difficult to reconcile with the unequivocal histological picture of biliary cirrhosis which the liver of each child exhibited.

In the case of the baby, in which the infective cirrhosis was in an early stage, it is conceivable that the inflammatory exudate within the smaller ducts may have stopped short of their complete occlusion. In the older girl the lesions had advanced from the cellular to the fibrotic stage, and contraction of the newly formed fibrous tissue may not yet have reached the point at which it would exert a strangling effect on the bile ducts.

Up to this point discussion of the subject of biliary cirrhosis in children has been confined to infective cirrhosis in which obstruction in the extrahepatic biliary system has played no part. The entry of the obstructive factor is to be seen in the case of a third child, David B., aged one year and eight months, who was admitted to the

Children's Hospital on April 17, 1937, and who died twenty-five days later. The relevant points in the child's clinical history are that two months prior to admission he had begun to suffer from diarrhoea, which had persisted; there had been much vomiting during the three weeks immediately preceding the baby's admission to hospital, and he had become very peevish and irritable, exhibiting decided photophobia.

The preliminary physical examination was attended by negative findings, with the single exception that the edge of the liver was observed to be palpable. In the ensuing three weeks the baby sustained a high temperature, his leucocyte count reached 39,000 cells per cubic millimetre, 70% of the cells being polymorphonuclear, and his liver steadily enlarged. Jaundice was first noted on the eleventh day after the child's admission; and, as the illness progressed, it became more and more conspicuous, until at the time of death it was of severe degree.

The autopsy was conducted by Dr. Stanley Williams, whose notes describe the liver as enlarged, brownish in appearance, and very firm, the cut surface showing innumerable white dots. Dissection of the biliary passages disclosed an obstruction in the common bile duct, of the nature of kinking rather than actual stenosis, but sufficient to occasion difficulty in the passage of a probe through the duct. The gall-bladder was greatly distended, and contained bile of a light yellow colour.

My report on the microscopical section of the liver, extracted from the *post mortem* record, was as follows:

The microscopical section of the liver shows an apparently great increase in the number of bile ducts, with much cellular reaction and increase of fibrous tissue in the portal tracts. Polymorphonuclear leucocytes are prominent among the cells. Deposition of bile is to be observed in the hepatic parenchyma, also some fatty change, but the principal incidence of the inflammatory process appears to lie in the portal tracts.

Here, then, was a biliary cirrhosis in which both obstructive and infective factors were engaged, and the old formula "stasis and infection" was again applicable. From the literature on the subject of biliary cirrhosis one gathers that the combination of obstruction and infection operates to produce this condition much more frequently than infection alone. In the case of this child, David B., antecedent diarrhoea for two months was again suggestive of an ascending infection from the intestine.

The outstanding example of purely obstructive biliary cirrhosis in children is, of course, that provided by congenital obliteration of the bile ducts. In infants thus affected and dying within the first few days after birth the liver may show little abnormal apart from a deep green discoloration. In such as live for a few weeks or months the surface of the liver is uniformly covered with fine granulations and is aptly described by MacMahon and Mallory²⁰ as resembling fine morocco leather. The liver remains small, is tough, and is resistant to cutting. In the very early stages microscopic study may disclose little more than evidence of bile stasis; but at a later date the same picture of apparently numerous bile ducts, increase of stroma in the portal tracts and atrophy of liver cells at the periphery of the lobules, as described for infective cirrhosis, is to be observed. Apparently the retention of bile excites proliferation of the bile duct epithelium and the ducts thereby become lengthened and tortuous; but no new bile ducts are formed. This process goes on in every portal area throughout the liver, and is accompanied by proliferation of fibroblasts in the portal areas as it progresses.

In experimental obstructive cirrhosis the rapidity of development of the characteristic changes is remarkable, as judged from a photomicrograph published by H. E. MacMahon, J. S. Lawrence and S. J. Maddock,²¹ of a portal area in the liver of a guinea-pig as it appeared twelve days after ligation of the common bile duct. All the characteristic histological changes seem to have become established in so short a time, and the photomicrograph is scarcely to be distinguished from Figure XIV of this communication.

There have not been wanting those who have regarded congenital atresia of the bile ducts and the associated biliary cirrhosis as of infective origin, the end-results of cholangitis and hepatitis occurring during fetal life and referable to maternal toxins and infections. Mallory, indeed, in his paper which appeared in 1911 and to which reference has already been made,³⁰ spoke of two cases of congenital atresia with a uniformly distributed cirrhotic process and obliteration of the common bile duct as undoubtedly due to intrauterine infection extending along the bile ducts. In a much later paper,³¹ however, in conjunction with H. E. MacMahon, Mallory subscribed to the view that congenital atresia of the extrahepatic bile ducts was primarily a developmental anomaly, and that the cirrhotic changes in the liver were entirely secondary. MacMahon and Mallory³² have described and laid much emphasis on developmental anomalies in the intrahepatic biliary system; but on this point I am not competent to comment.

The period for which infants affected by congenital obliteration of the bile ducts can sustain life varies remarkably. In a series of ten of which I have *post mortem* records, one baby lived till the age of nine months, and another survived for eight months; one lived for seven and a half months, and three for five months. Reports of survival for six to eight months are not uncommon, and comparative longevity for a subject of congenital obliteration of the bile ducts was attained by an infant reported by Porter³³ as living as long as fourteen months.

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³⁰ S. O. Cowen: "A Case of Subacute Proliferative Cholangitis", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume II, 1920, page 172.

³¹ F. B. Mallory: "Cirrhosis of the Liver: Five Different Types of Lesion from which it may arise", *Bulletin of the Johns Hopkins Hospital*, Volume XXII, Number 240, March, 1911, page 69.

³² H. E. MacMahon and F. B. Mallory: *The American Journal of Pathology*, Volume V, Number 6, 1929, page 645.

³³ H. E. MacMahon, J. S. Lawrence and S. J. Maddock: "Experimental Obstructive Cirrhosis", *The American Journal of Pathology*, Volume V, Number 6, 1929, page 631.

³⁴ L. Porter: "Pædiatrics", Volume III, 1923, Philadelphia, I. A. Abt.

Reviews.

BACTERIOLOGICAL CHEMISTRY.

C. G. ANDERSON'S "Introduction to Bacteriological Chemistry" is a review of a very wide subject in a remarkably concise form.¹ The author, who was trained in the research schools of H. N. Haworth (Birmingham) and H. Raistrick (London) regards his subject from the viewpoints both of a chemist and of a microbiologist. The book thus represents a comprehensive study of the facts of microbiological chemistry, presented in a manner that should make it useful for teaching purposes. It also makes attractive reading for those who wish to "brush up" their knowledge of this part of bacteriology without having to consult the original literature. The names of authors who have devised reaction mechanisms are conscientiously quoted; but it would be made easier for the reader to refer to the original literature if names were also given of those who have isolated and identified the metabolic products of microorganisms. The author has brought his subject matter to the state of recent knowledge. The chapter on alcoholic fermentation makes a striking exception. Here the latest reference to Meyerhof's work is dated 1933, whereas fundamental contributions to the elucidation of the mechanism of alcoholic fermentation have been published by Meyerhof since then.

The book is divided into three main parts. The first deals with the facts of hydrogen ion concentration, oxidation reduction potentials, colloids and adsorption, enzymes and the chemical composition of bacteria, and yeast and the lower fungi. The second part deals with metabolism. The living conditions of microorganisms are shortly discussed

¹ "An Introduction to Bacteriological Chemistry", by C. G. Anderson, Ph.D., D.Bact.; 1938. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 256. Price: 10s. 6d. net.

in the chapters on the nutrition of autotrophic and heterotrophic bacteria, on adaptive and constitutive enzymes, and on growth factors. Respiration, metabolic products and body constituents are subsequently treated in greater detail. Reference is made to the various theories of alcoholic fermentation (Cluyver, Neuberg, Meyerhof), but the author does not take sides in the discussion. A short survey is given of industrial fermentation. The third part comprises "some aspects of immunochemistry", that is, antigens, haptens, antibodies and the mechanism of antigen-antibody reactions. Such subjects as disinfection and chemotherapy, the chemistry of culture media and staining reactions have been omitted, but "their treatment could be but little more than a catalogue of substances or organisms for... we have yet but little exact knowledge of the mechanisms involved". In the appendix valuable hints are given for the isolation and identification of metabolic products. The index is remarkably complete.

CHROMOTHERAPY.

DR. R. DOUGLAS HOWAT has written a somewhat provocative book.¹ His "Elements of Chromotherapy" should be of interest to all who use infra-red or ultra-violet radiation. His main thesis is that by the use of various colour filters (red, yellow, green and blue) with a 1,000-watt tungsten filament lamp it is possible to obtain specific effects in the treatment of disease.

The history and physics of actinotherapy are concisely described, and there is an interesting chapter dealing with the effects of colour on bacterial growth and plant life. The author gives a short description of various instruments, the technique necessary for their use, and twenty-five case records. After a careful consideration of the latter we believe it not improbable that most of the results claimed for the very elaborate technique could have been achieved by the use of plain infra-red or ultra-violet radiation or by a combination of both.

His claims, especially for the red filter, are very sweeping: "The red filter is almost specific in the treatment of lumbago, myalgia, rheumatoid arthritis, perioritis, sciatica and every form of neuritis. It is also, in my opinion, an essential in the after-treatment of fractures and fractural dislocations." In the case records there is a tendency on Howat's part to be too certain that improvement is due to one special form of treatment. For instance, a patient manifesting a low blood pressure was being treated with infra-red and ultra-violet rays and with rays passing through the yellow filter. The blood pressure rose in a satisfactory way, and the yellow filter gets all the credit.

The book ends with an excellent bibliography and index.

Notes on Books, Current Journals and New Appliances.

"THE MEDICAL ANNUAL."

"THE MEDICAL ANNUAL" for 1938 has appeared.² To those who are accustomed to reading this periodical we need only say that the 1938 issue is comparable in standard with its predecessors. Those who have not yet formed the habit we would advise to commence its cultivation at once. As a concise record of the year's work "The Medical Annual" is invaluable.

¹ "Elements of Chromotherapy: The Administration of Ultra-Violet, Infra-Red and Luminous Rays through Colour Filters", by R. D. Howat, L.R.C.P., L.R.C.S., L.R.F.P.S., with a foreword by Sir Henry Gauvain, M.D., M.Chir., F.R.C.S.; 1938. London: The Actinic Press Limited. Demy 8vo, pp. 126, with illustrations. Price: 3s. 6d. net.

² "The Medical Annual: A Year Book of Treatment and Practitioner's Index", edited by E. L. Tidy, M.A., M.D., F.R.C.P., and A. R. Short, M.D., B.S., B.Sc., F.R.C.S.; 1938. Bristol: John Wright and Sons Limited; London: Simpkin Marshall Limited. Demy 8vo, pp. 767, with 103 text illustrations and 68 plates, plain and coloured. Price: 20s. net.

The Medical Journal of Australia

SATURDAY, AUGUST 13, 1938.

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THE DECLINING BIRTH RATE.

RECENTLY attention has been again focused on the outstanding fall in the birth rate which has occurred in Australia in common with most European countries, and especially with America, during the past three-quarters of a century. If the present trend continues for another ten years our annual growth of population, in the absence of immigration, will be insignificant, and by about the year 1955 Australia's population will be practically stationary. The decline in the birth rate has been offset to some extent by a decrease in the general mortality and by a great reduction in infant mortality. We are proud of the increasing expectation of life at birth. A healthy longevity is regarded as a vindication of sound public health measures. Through the interaction of these factors old age is increasing while youth is on the wane, and there is every indication that in the future a smaller number of young persons will have to maintain a larger and increasing number of old persons. It is inevitable that a population so constituted must experience an increasing mortality rate, and it will be ironical if the medical profession is eventually held responsible in some way for this outcome.

The problem of population comprises three elements: natality, mortality and immigration. The first two come within the scope of the medical practitioner so far as the individual is concerned; but their real determining relationship to population lies outside the doctor's province. It has been the function, first of the economist and later of the biologist, to elucidate the main problems in this field. The biologist rather than the economist seems likely to be the more valuable helper in the immediate future; but ethical, sociological and even political questions are now recognized to be involved in the problem. From the biological viewpoint a falling birth rate is not necessarily a sign of the approaching end of a people or a culture, but rather of a population growth cycle. The growth of a population is regulated in large measure by its density, the birth rate falling as the density increases. Density applies not only to a country but also to its housing accommodation. If building construction falls short of babies' requirements, babies will make their appearance very reluctantly. It is perhaps not without significance that flats have increased at the expense of houses; children are as a rule not welcome in flats. Economic factors are no less important. Insecurity has been the outstanding feature of the political and industrial world for at least the last fifty years. This feeling of uncertainty dogs the lives of multitudes of people, and probably conflicts with the natural tendency to the procreation of children. In an atmosphere of insecurity parents are not anxious to have large families which may prove an incubus; moreover, the lack of domestic assistance is a definite discouragement to potential mothers whose outlook is not confined exclusively to domestic chores. Our high standard of living is in this connexion not an unmixed blessing. Parents naturally desire to advance their children to a higher level in the social scale than they themselves were able to reach. That aim, laudable in many respects, is facilitated when parents are not encumbered with many children.

There is thus a constant tendency towards "social capillarity" whereby each section of the community strives to reach the status of the class

economically or socially above it. This concept was formulated some fifty years ago by Arsène Dumont. In his day the ideal of all Frenchmen was a career as a government official, and the ideal of all officials was advancement in the hierarchy. But, "*Ici, comme sur toutes les routes de l'ambition, pour monter vite et haut, il ne faut pas s'embarrasser de bagages*". Voluntary control of conception has undoubtedly prevented the birth of many individual babies; but it may be doubted whether it is valid to dogmatize that this factor is the fundamental cause of the decline of the birth rate. The fall in the birth rate of western peoples has been smooth, progressive and universal over a long period of time. This suggests the operation of biological factors rather than the effect of contraceptive methods.

It may be that the problem of depopulation is one of spiritual values. We have to deal with a society that has lost not indeed the power but the will to survive. Greece and Rome are classical examples of civilizations which crumbled into ruin for lack of men. Seeley, referring to the Roman Empire, says: "It perished for the want of men . . . it was a period of sterility or barrenness in human beings; the human harvest was bad." Let us hope that this will not be the epitaph of our own civilization.

Current Comment.

THE RELATION BETWEEN DUODENAL STIMULATION AND THE SUGAR CONTENT OF THE BLOOD.

SOME time ago reference was made in these pages to the possibility that duodenal extract had some influence on *diabetes mellitus* in man. In view of the very complex endocrine mesh which surrounds the activities of the pancreas, or, to put it more accurately, the nexus which constantly brings its workings into relation with other ductless glands, such as the thyroid, the pituitary and the adrenal, it did not seem likely that this fact would prove of much clinical value. However, inquiry and not discouragement is the right course to pursue, and we must remember that we are even here treading in the path laid down by Bayliss and Starling, their few predecessors and their many followers in the studies of hormones. It is of interest to read that Leuret and Lassaigue as far back as 1825 found that weak acids, such as are present in chyme, stimulated a flow of pancreatic juice. The

real purport of this work was not realized at the time. This and other brief references to the history of the subject open the article by H. Shay, J. Gershon-Cohen and S. S. Fels on the effect of duodenal stimulation upon hyperglycemia in man.¹

The use of extracts of the duodenum in diabetes has been recommended off and on for a good many years; but the subject remained cloudy until a hypoglycemic factor, apart from the secretogenic factor, was discovered in duodenal extract. By animal experimentation it was proved that a relationship existed between the duodenum and the control of alimentary hyperglycemia, and it then remained to discover if these findings could be applied to man. Diabetes abounds with pathological and biochemical puzzles. We know that serious damage or atrophy of pancreatic islets cannot always be demonstrated; and even when the agency of the other ductless glands is not invoked it would appear that the mere supply of insulin does not yield the complete answer to our problems in this disease. Incidentally, it is well known that the effect of insulin in the treatment of a diabetic patient under standard conditions does not bear a simple linear ratio to the dose. Shay, Gershon-Cohen and Fels carried out upon human subjects a series of experiments which arose out of the observation that the pylorus could be closed by duodenal stimulation. The method of stimulation used was the instillation of a fluid containing hydrochloric acid, though it was found that an acid medium was by no means essential, since other substances could be used with equal success. A duodenal tube was passed and its position verified by means of X ray examination. Continuous slow drip infusion was then begun, whereupon closure of the pylorus could be demonstrated, again by radiological methods, to take place and to be maintained over considerable periods of time. While the pylorus was thus closed glucose solution was ingested by the subject; analyses of the gastric contents were then made from time to time, the stomach being finally washed out several times after withdrawal of the duodenal tube, so as to account completely for all the glucose. Analyses showed that glucose was absorbed by the stomach at least when in relatively high concentration, but that duodenal stimulation with hydrochloric acid prevented an increase in the blood sugar, such as might have been expected after gastric absorption. This result in normal persons was also obtained in one diabetic patient; but in another, whose pancreas was apparently calcified and who suffered from severe diabetes, it was not. Alimentary hyperglycemia therefore seems to be controlled in man by duodenal stimulation, though the normal fasting blood sugar level and the hyperglycemia due to adrenaline remain unaltered. The authors, examining all the possible explanations, consider that the mechanism concerned may be stimulation of the pancreatic islets or the liberation of some duodenal hormone affecting glucose metabolism.

¹ *Annals of Internal Medicine*, March, 1938.

They believe that stimulation of the islets is the more likely cause, and on this assumption consider that duodenal extracts cannot be regarded as a desirable adjunct to the treatment of diabetes. In a mild case islet stimulation might produce some good effect, but in a severe case of the disease harm might be done by exhaustion of islet tissue.

The theory of this subject is not completely worked out; for with the other and more obvious methods of islet stimulation, such as the use of glucose itself, it does not seem likely that this explanation gives the whole story. Still, although no useful clinical results can flow from such work as yet, the pattern of sugar metabolism is gradually becoming more distinct.

ADIPOSIS DOLOROSA.

ADIPOSIS DOLOROSA (Dercum's disease) is a very uncommon condition, the pathogenesis of which is not understood. It has been suggested that it is due to disease of the posterior lobe of the pituitary gland in adults. In the young a similar disturbance causes *dystrophia adiposogenitalis* (Fröhlich's disease). In both conditions there is said to be a decrease in the activity of the posterior lobe, and in patients manifesting Fröhlich's syndrome a tumour has been found in or about the pituitary gland. A pronounced feature of some, but not all, sufferers from *adiposis dolorosa* has been pronounced asthenia.

M. G. Wohl and N. Pastor state that about 250 cases have been described in the literature of the world since the original report by Dercum in 1888.¹ Since the disease is not always recognized, it may not be as infrequent as would appear. On the European continent there is a tendency to deny the existence of *adiposis dolorosa* as a clinical entity. Wohl and Pastor, following G. Laroche, look upon the condition as a syndrome rather than a disease *per se*. They recognize four cardinal signs: adiposity, asthenia, pain and psychical disturbances. The asthenia is profound and the least amount of effort readily induces fatigue. Eventually the patient becomes completely incapacitated. In the three patients under observation by the authors asthenia overshadowed all other manifestations, but it was successfully combated by the oral administration of amino-acetic acid and prostigmin ammonium bromide. These drugs had not previously been used in Dercum's disease.

Wohl and Pastor state that the diagnosis of this condition is often difficult and is based on the existence of painful nodular obesity, associated with psychoneurotic manifestations and asthenia. In one of their three patients there was a mild degree of progressive muscular dystrophy. That the nodules are not those of von Recklinghausen's disease is demonstrated by the fact that in the

latter disorder they are firmer and follow the course of nerve trunks. In the cases here considered myxœdema was excluded from the differential diagnosis, as the basal metabolic readings of two patients were above normal and the blood cholesterol estimation yielded low figures. The basal metabolic rate of the third patient was 25% below normal, and the blood cholesterol content was 138 milligrammes per 100 cubic centimetres. This patient had painful fatty nodules and did not improve after the administration of thyroid gland, which raised the basal metabolic rate practically to normal. As *adiposis dolorosa* is considered by many to be associated with pituitary deficiency, the low basal metabolic rate can be held to be due to that endocrine disorder. The authors' three patients displayed a peculiar reaction of the sternocleidomastoid and *extensor indicis proprius* muscles to faradic current stimulation. This fact suggested the possible coexistence of some abnormal muscle metabolism resembling that seen in *myasthenia gravis*. After the intramuscular administration of prostigmin to the patients, muscle contraction could be elicited for a longer time than before the administration. Wohl and Pastor found that the response of the muscles to prostigmin injections was striking. Such immediate improvement had been stated to be characteristic of *myasthenia gravis*. O. Folin and K. O. Klerker had demonstrated that normal adults excrete little or no creatine. However, the creatine content of the urine was definitely increased in certain myopathies. Creatinuria had been recorded in *myasthenia gravis*, and H. Edgeworth had stated that creatinuria and lowered excretion of creatinine occurred in that disease. The urine of the patients here described had high creatine values. Amino-acetic acid plays an important part in creatine metabolism, and it has been stated to produce benefit in *myasthenia gravis*. In two of the authors' cases the pronounced asthenia was attributed to a disturbance of muscle metabolism similar to that in *myasthenia*. Prostigmin combined with amino-acetic acid produced much greater benefit than prostigmin alone. It was also noticed that amino-acetic acid was of considerable benefit to four patients with obesity in whom a reduction of caloric intake induced extreme weakness.

These observations are of interest not only in relation to the treatment of Dercum's disease, but also in the promotion of a better understanding of its nature. Sir Walter Langdon-Brown maintains that pathological obesity may be due to lesions anywhere in the "unit" composed of the hypothalamus, pituitary stalk and posterior lobe of the pituitary gland, that *adiposis dolorosa* in all probability is due to a disturbance of some part of this unit, and that it may be deduced from the obvious signs of nervous disorder that the hypothalamus is certainly involved.¹ We have still to seek what connexion, if any, exists between *adiposis dolorosa* and *myasthenia gravis*.

¹ The Journal of the American Medical Association, April 16, 1938.

¹ The British Medical Journal, November 14, 1936.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Angioid Streaks with Pseudo-Xanthoma Elasticum.

J. GROENBLAD (*Archives of Ophthalmology*, January, 1938) describes the appearance of angioid streaks in the retina and reviews the cases of this condition reported during the last fifty years. In most patients other lesions are found, especially in the macular regions, where there may occur a prominent greyish white mass with pigmented dots on the surface, described as diskiform macular degeneration. Other white spots and sometimes hemorrhages are found in the fundus. The most probable explanation of the angioid streaks is that they are ruptures in the *lamina vitrea* or Bruch's membrane. Groenblad has reported two cases in which the patients had a typical lesion of the skin, called by Stranberg *pseudo-xanthoma elasticum*. It consists of yellowish white papulous spots, and occurs most commonly on the throat and in the axillary and inguinal regions. There is a disturbance in the normal elastic fibrillar structure of the skin. Angioid streaks in the retina may therefore be considered as ocular manifestations of a more general disease of the elastic connective tissue. The author reports the case of a man of forty-six years of age with this condition; he was able to watch the progress of the macular condition for six months. The sister of the patient was similarly affected. The author concludes that this syndrome of Groenblad and Stranberg may be due to a recessive hereditary factor.

Vitamin A Content of the Blood in Some Patients with Ocular Symptoms of A-Avitaminosis.

B. L. SIE (*Archiv für Augenheilkunde*, November, 1937) has estimated the amounts of vitamin A and carotin in the blood of patients with ocular signs of A-avitaminosis. With one exception the patients were adults. The exception, a child aged ten years, was the only patient who showed the most severe result of this vitamin deficiency (xerophthalmia) which is almost confined to children. During two years in the large clinic in Batavia only fourteen adult patients with A-avitaminosis were seen. In addition, two patients from another clinic were considered. Thirteen of the patients showed Bitot's spot (that is, the area of xerosis that bears his name) and suffered from night-blindness. Two others did not have Bitot's spot. At least nine of the fifteen patients complained of night-blindness. Two of these patients had noticed this symptom for from five

to eight months, and the others from one to three weeks. This symptom usually precedes others that are due to lack of vitamin A. Only three patients stated that they had not been night-blind, but one of these showed a reduction in the power of distinguishing different light intensities. This reduction disappeared after the patient was given cod-liver oil by mouth. Bitot's spot is not always present in A-hypovitaminosis with night-blindness, and yet it may be seen even when the vitamin A content has risen to normal. In two patients it was found that although the clinical symptoms of insufficiency of vitamin A disappeared after corrective nourishment, the vitamin A content of the blood remained low. One of these patients was very undernourished, with festering sores on lips, arms and legs, swollen legs and genitals and marked Bitot's spots on each eye. The conjunctiva was slightly pigmented around the cornea and the transitional fold. On the patient's admission to hospital the vitamin A content of the blood serum was 32 international units per 100 cubic centimetres. The patient received ordinary hospital food. The spots disappeared in ten days, but the blood contained less than half the amount of vitamin A, that is, 11 international units per 100 cubic centimetres of serum. Twelve days later the spots reappeared. After the examination of thirty persons in poor circumstances it was decided that the normal figure under such conditions was a total of 109 international units per 100 cubic centimetres of serum. The patients showed a considerably lower average. With one exception the values derived from tests were below 70 international units per 100 cubic centimetres of serum. In only three was vitamin A completely absent; the condition of the remainder, therefore, should be referred to as hypovitaminosis, not avitaminosis. Though the carotene content was very small in some of the patients' serum, yet carotene was never absent. The author considers that not infrequently there is a lower vitamin A content in the blood of people who show no clinical evidence of the deficiency than in those with definite symptoms. He infers that the proportion of this substance to other substances in the body must be taken into consideration.

Intraocular Foreign Bodies.

W. H. STOKES (*Archives of Ophthalmology*, February, 1938) analyses a series of 300 cases of intraocular foreign bodies and forms certain conclusions. The foreign body was removed from the anterior segment of the eye by the anterior route in 67 cases. Half the patients retained good vision, whereas in 73 cases in which the body was located in the posterior segment and the anterior route was employed, only 13% of patients retained good vision, and in 50% vision was entirely lost. In 39 cases the foreign body was located

in the posterior segment and removed by the posterior route; 45% of the patients obtained good vision. In 101 cases the foreign body was not removed at the time of the accident. It was found that a foreign body could be retained in the anterior chamber for a number of years with preservation of perfect vision, but when it was retained in the vitreous the eye was invariably lost. The author considers it a regrettable fact that in too many instances in which the eye and vision were good and in which the foreign body was removed, the vision was reduced. He also states that enucleation was required in too many cases. The belief that the retention of a foreign body in the globe will give rise to sympathetic ophthalmia seems to be founded on a false premise. Sympathetic ophthalmia developed in only one patient, a boy, aged twelve years; this development occurred three months after a foreign body had been removed from the iris. More recently the author has used three or four electro-coagulation pins when extracting foreign bodies by the posterior route.

Adie's Syndrome.

F. KENNEDY *et alii* (*Archives of Ophthalmology*, January, 1938) report five cases of Adie's syndrome, emphasizing the point that some unfortunate patients have been mistakenly treated for tabes and have incurred some odium as presumptive victims of syphilis. In each of the five patients there was no evidence of syphilis. The examination revealed the typical features of the tonic or myotonic pupil. The condition is unilateral in 80% of the cases. The affected pupil is usually larger than its fellow; with accommodation the pupil contracts to a greater degree than normal and then dilates even more slowly. The pupil dilates in a dark room and reacts normally and completely to mydriatics. There is very often an absence of the knee jerks and ankle jerks. Association with emotional disturbances is not uncommon.

Abnormal Retinal Correspondence.

C. BURRI (*Archives of Ophthalmology*, March, 1938) deduces from current literature what is meant by abnormal retinal correspondence by the following example. A child with 20 degrees of squint fuses two pictures in the synoptophore around zero or much nearer to zero than would be expected from the angle of his squint. The two maculae are apparently not used together, and the child is said to have abnormal or false projection. The question that arises is whether the theory of abnormal correspondence and projection is based on demonstrable facts or subjective inferences. Recent work has shown the difficulty of obtaining neurological information on the correspondence of the two ocular images. The nature of retinal correspondence is little understood

and remains on a purely theoretical basis. While correspondence is important for fusion, retinal disparity seems to be equally important for depth perception. It is more likely that retinal correspondence is based on some dynamic concept rather than on a static cell-to-cell relationship. The author has carried out studies of retinal correspondence in three groups of forty persons each. The first group was composed of normal persons, the second of those with heterophoria, the third of persons with squint. It was found that the variation from zero was about the same for persons with squint and those with heterophoria, while it was somewhat less for persons with normal eyes. Evidently the whole idea of retinal correspondence has been taken too literally. The author considers that it would be far better to consider fusion and projection as perceptual processes which must be learnt.

OTO-RHINO-LARYNGOLOGY.

Treatment of Vasomotor Rhinitis and Allied Conditions with Sodium Morrhuate.

FRANK E. FISHOF (*Archives of Otolaryngology*, April, 1938) gives a preliminary report of the treatment of vasomotor rhinitis and allied conditions with sodium morrhuate. The cases reported are those in which the disease was refractory to other methods of treatment but responded favourably to injections of sodium morrhuate. This method is preferred because, in this author's opinion, it does not destroy the physiological functions of the nasal mucosa. The amount of contraction of the turbinates can be controlled by regulating the amount of fluid to be injected. By use of the Fishof needle other fluid can be applied at points at which it is most desirable. The drug is inexpensive. An ampoule containing five cubic centimetres is more than sufficient for clearing up the condition. The treatment does not require expensive apparatus. It is important not to inject too much fluid at a given point, lest necrosis result; the injections must not be given too often, and no injection should be given in the presence of an acute superimposed infection.

Post-Operative Repair of the Paranasal Sinuses.

M. A. GLATT (*Archives of Otolaryngology*, March, 1938) presents experimental data on the reparative processes which follow the radical removal of the mucoperiosteal lining from the paranasal sinuses and discusses the practical application of his findings. It has been observed in some animals that after removal of the mucoperiosteum there is complete obliteration of the sinus. In the

human being, however, the extent of obliteration depends on the size of the involved sinus, the health of the bone, the amount of accumulated blood in the sinus and the patency of the existing or of the established communication with the nose. Usually the disease process in the mucosa does not affect the bone, or affects it only slightly or not uniformly. In the post-operative repair there may be, therefore, a formation of a moderate or a large amount of granulation tissue of varying thickness in the same sinus, which is subsequently changed into bone and fibrous tissue. The latter replaces the periosteum, which was a part of the original mucoperiosteum. The removal of the mucosa at a natural opening may result either in complete closure or in diminution of the opening. This prevents renewal of the epithelial lining of the sinus through that source and further assists the process of its obliteration. The latter condition, however, is counteracted when other communications with the nasal cavity are established. Clinically, the reduction in the size of the sinuses has been demonstrated at a second operation, by probing the depth of the sinuses and by comparing the Röntgenological studies before the surgical operation with those made several months or years later. Proliferation of the nasal epithelium into the sinus takes place either by way of the natural or the newly established opening or by the laying in of a mucoperiosteal flap. The growth of epithelium, however, does not take place synchronously with the repair of the other tissues. Invagination of the proliferating epithelium occurs in the early stages of repair, before the blood clot becomes organized into connective tissue or when it meets an uneven surface of scar tissue. The invaginations in most instances have the appearance of atypical glands. There is a possibility that these atypical glands contribute to the formation of post-operative cysts. In most instances the newly formed tissue of the sinuses becomes covered with a layer of pseudo-stratified columnar ciliated epithelium, interspersed with goblet cells. In exceptional instances the following features have been observed: a complete lack of epithelial growth, a partial covering of the operative area with pseudo-stratified ciliated columnar or cuboidal epithelium while other parts remained bare of epithelium, and a covering of some areas with pseudo-stratified columnar ciliated epithelium and of the remainder with cuboidal epithelium. The final clinical interpretation of all these histological observations is a favourable one. Remnants of mucous membrane which are left in the sinuses accidentally or with the hope that they will unite with the newly formed epithelium or help to refine the sinus with epithelium may become completely covered over or may be embodied in the scar tissue. They may cause no harm or they may be

a source of cyst formation and reinfection. It follows that surgical procedures which consist of incomplete removal of the mucosa may have disappointing results. From his histological studies the author concludes that after the complete removal of the mucoperiosteum in a case of uncomplicated sinus disease, drainage, ventilation and growth of epithelium in the operative area are of little importance in the attainment of satisfactory end-results.

Continuously Open Eustachian Tube.

GEORGE E. SHAMBAUGH, JUNIOR (*Archives of Otolaryngology*, April, 1938), states that the continuously open Eustachian tube may be caused by extreme emaciation, as pointed out by Bezold, owing to disappearance of the normal pad of fat from around the cartilaginous tube. It may, on the other hand, be the result of atrophy of the mucosa in the mouth of the tube, of contraction of scar tissue adhesions in the fossa of Rosenmüller, or of destruction of part of the cartilaginous orifice of the Eustachian tube by carcinoma. In every case of low-pitched tinnitus of obscure cause the diagnosis of continuously open Eustachian tube should be considered. The concomitant symptom of autophonia and the frequency with which relief can be obtained by holding the nose and sniffing strongly are other indications of this condition. The diagnosis may be made by hearing the patient's breathing through the auscultation tube and by the therapeutic test of insufflation of powdered salicylic and boric acid. The treatment is simple and effective. It consists of occasional insufflation of a pinch of powder made up of one part of salicylic acid and four parts of boric acid, together with treatment of any associated atrophy of the nasal and nasopharyngeal mucosa by nasal irrigations with physiological solution of sodium chloride once or twice a day.

Infection of the Blood Stream.

ELBYRNE G. GILL (*Archives of Otolaryngology*, January, 1938) discusses the medical treatment of infections of the blood stream, with special reference to transfusions of immunized blood. He gives a report of cases and concludes that transfusion of immunized whole blood should be given for its prophylactic value to persons with lowered resistance, as indicated by the opsonic index and the blood picture. In cases of infection of the blood stream and of the fixed tissues, transfusion of immunized whole blood has a curative value and should be administered every other day until the well-being of the patient justifies discontinuance. In the author's opinion the treatment of infection of the blood stream secondary to infection of the middle ear and mastoid should be primarily medical.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on May 26, 1938, in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, Dr. B. T. EBYE, the President, in the chair.

Nutrition in Childhood.

Dr. DONALD VICKERY read a paper entitled "Vitamins in the Nutrition of Children" (see page 225).

Dr. F. S. HANSMAN read a paper entitled "The Nutrition of the Child" (see page 233).

Dr. E. H. M. STEPHEN read a paper entitled "The Nutrition of Children" (see page 228).

Dr. LORIMER DODS said that he was particularly glad to hear each of the speakers emphasize the fact that it was a relatively easy matter to construct a simple diet containing adequate supplies of the essential minerals and vitamins. He felt that, with the exception of vitamin D during infancy, there was rarely any need for the addition of extra vitamins or minerals to such a diet. Dr. Hansman's table of foodstuffs suggested the simple but essentially practical classification of foods as either "protective" or "energy-producing". The "protective" foods included milk, milk products, fresh meat, fruit and vegetables, and provided the essential minerals, vitamins and first-grade proteins, while the energy-producing foods were represented by the starches, sugars and some fats. Dr. Dods assumed that if more than 50% of the Calories of a diet were supplied by "protective" foods, then such a diet probably contained adequate supplies of calcium, phosphorus, vitamins and first-grade proteins. Many of the children attending his out-patient clinic received barely 30% to 30% of their Calories from "protective" foods; and Clements's nutritional survey of inland areas of Australia had revealed the fact that in certain areas approximately 50% of the children were not receiving any "protective" foods.

Dr. Dods assumed that a child required about two grammes of protein per kilogram of body weight; he pointed out that a child weighing about 22.7 kilograms (50 pounds) needed approximately 44 grammes of protein, which would be provided by one and a quarter pints of milk, 57 grammes (two ounces) of meat or fish and one egg. He was interested in Dr. Hansman's statement that 0.3 gramme of calcium a day was probably sufficient for a child; he had assumed that the average child required about one gramme of calcium a day, and that this amount was provided by one pint of milk. He agreed with Dr. Hansman's view that an adequate supply of first-grade protein would provide sufficient phosphorus for the growing child. To complete the child's diet, vegetables, including one of the pigmented variety, fruit, butter and limited amounts of sugars and starches were needed. The sugars and starches should be added in sufficient amounts only to complete the diet and not to replace the protective foods. The great majority of children attending the out-patient department of the Royal Alexandra Hospital for Children were receiving an excess of cereal foods in their diet. The usual highly milled cereal was palatable, cheap and satisfying, and as a result often provided more than half the Calories of a child's diet. Such a food supplied little more than starches and some vegetable protein, and, if it usurped a major place in the child's diet, must lead to some disturbance of nutrition. Genuine wholemeal cereals, because of their irritant laxative effects, were impracticable for most infants and young children. During recent years a certain amount of the mineral, vitamin and protein content of the bran and germ had been successfully incorporated in certain cereal products, which had been fortified with extra minerals and vitamins; a cereal prepared in this manner was "Farex".

Speaking of vitamin D, Dr. Dods stated that the need for an extra supply of vitamin D during the rapid growth period of the first eighteen months of life was a very real one; unfortunately the supply of vitamin D in natural foods was extremely limited. In Sydney the majority of infants received their extra vitamin D from a cod liver oil emulsion prepared by Elliott Brothers. This emulsion was made from high-grade east coast cod liver oil, the vitamin content of which had been certified by the British Pharmaceutical Research Council; it was forwarded to Australia in air-tight drums, and during its emulsification it was protected as much as possible from any exposure to air or heat. The vitamin D content of this emulsion was standardized at 1,400 units of vitamin D per ounce. Unfortunately no "line tests" of its vitamin D content were carried out in Australia. Dr. Dods considered that it was most unfortunate that these "line tests", which consisted in the histological proof of healing rickets in special rats, could not be carried out in this country at present. He hoped that the National Health and Medical Research Council would realize the importance of this matter and would provide facilities for this work in the near future.

Dr. Vickery had mentioned the ascorbic acid excretion test. Dr. Dods was sceptical about it as a test for latent scurvy. Some of the results which he had obtained with this test had been equivocal; and he cited the case of a child in the Melbourne Children's Hospital, who, although suffering from clinical scurvy, failed to give a positive test for latent scurvy.

Dr. NORMAN CUNNINGHAM remarked on Dr. Hansman's contention that dental caries was due to soft, messy carbohydrate foods taken by the child. He wondered whether Dr. Hansman would say that the nutrition of the mother during pregnancy was of no importance in regard to the child's teeth, and whether the exhibition of iron and calcium during the early months, when the teeth were really forming, would be useless in helping to prevent the onset of dental caries.

Dr. CLIFTON WALKER said that grapes had been mentioned by both Dr. Vickery and Dr. Stephen, and he wondered why grapes were considered such a good source of vitamin C. The figures he had seen indicated that they were a very poor source. Commenting on Dr. Hansman's statement about the possibility of avoiding dental caries by the elimination of biscuits and soft sweets from the diet, Dr. Walker said that he was not so optimistic. He had been very particular about the antenatal diet of mothers, yet the teeth of babies and young children were unsatisfactory. He thought it unlikely that the soluble sugars, as in sweets, could stay around teeth long enough to cause trouble; if carbohydrates were at fault, the insoluble rather than the soluble ones would be expected to be responsible for dental caries.

Dr. Vickery, in reply, said that he was interested to learn of Dr. Dods's experiences in testing the urine for vitamin C content. This was only another instance of the things that one tended to accept from manufacturing firms. One should try out the tests for oneself. The tests that had to be carried out took hours; some were correct, some were incorrect.

Dr. Hansman, in reply, said that dental caries was the outstanding problem in nutrition in Australia. Knowledge of the causation of dental decay was not complete, but much more was known than was generally realized, and sufficient knowledge was available for dental caries to be prevented. The problem was undoubtedly complex. Teeth were developed from substances derived through the placenta from the blood of the mother, and later from the food given to the infant. If the mother received an ordinary mixed diet, and if the diet of the child contained foods having sufficient calcium and phosphorus, the teeth would develop satisfactorily in the great majority of cases. Granted a normal tooth development, the essential problem of dental caries was the cause of the initial solution of the enamel. The further problem of the progress or arrest of caries was quite another affair, and was outside the scope of the discussion. Only one thing could initiate

dental caries, solution of the enamel by acid, and this acid had to be produced by fermentation of carbohydrate. Soft biscuits and sticky sweets were the chief offenders. Dr. Hansman suggested to those present the experiment of eating a milk arrowroot biscuit, then washing out the mouth, then using a tooth-pick and finally again rinsing the mouth. They would then realize the amount of material that was left between the teeth. If a biscuit was eaten after the evening meal, when the child went to sleep and the secretion of saliva was practically in abeyance, the material between the teeth remained unmolested. The presence of a few acid-forming organisms was then capable of producing sufficient lactic acid to dissolve the enamel. The actual process of fermentation was apparently a complex affair and involved several stages: first, the breaking up of complex carbohydrate, probably by yeast-like organisms, then the splitting of the monosaccharides by *Bacillus acidophilus* and possibly some types of streptococci.

In reply to Dr. Cunningham, Dr. Hansman said he did not think it necessary to give special diets to pregnant women. Access to natural foods was all that was required. One proof that dental caries was not due to a poor dietary was that children who had restricted diets often had quite good teeth; for example, children living in an asylum where the food was very plain and contained comparatively small amounts of fruit and milk, often had perfect teeth, while children of the well-to-do, who in general received sweets and soft biscuits, had bad teeth in spite of the fact that the intake of fruit and milk might be quite satisfactory. The problem of the prevention of dental caries was one for the general practitioner and not one for the dentist.

Dr. B. T. Edey, from the chair, said that many practitioners in the ordinary routine of work forgot the subject of diet and were uncomfortably reminded of it by the inquiry of the patient as to what he could eat. Diet was becoming more and more important, and before many years had passed it was likely that the populace would be fed according to selected formulae. The discussion that he had just heard had caused Dr. Edey to wonder how children of his generation grew up to be healthy. They simply had the meals prepared for the household, but ate in addition much rubbish at irregular times. In all the foods thus consumed there must have been a sufficiency of the substances which comprised an adequate diet.

National Health Insurance.

AN ADDRESS ON NATIONAL HEALTH INSURANCE.

A MEETING of the Central Southern Medical Association of the New South Wales Branch of the British Medical Association was held at Goulburn on July 1, 1938. Dr. R. O. Williams read a paper entitled "The National Health Insurance Problem from Another Angle". This paper has been published in brochure form and has been distributed among members of the New South Wales Branch. It is published here at the request of the Central Southern Medical Association, so that all members of the British Medical Association in Australia may have the opportunity of reading it.

The National Health Insurance Problem from Another Angle.

A completely new situation has been precipitated by the action of the Federal Parliament in placing the *National Health and Pensions Insurance Act* on the statute book in practically its original form, and still containing most of its objectionable features.

We as a profession have to face squarely the situation thus created and take careful stock of our position. History and past experience prove that once an Act of

Parliament has been placed on the statute book there is a very remote chance of its ever being materially amended; for promises by governments have rarely been honoured. Take for example a few instances, such as the twopenny postage, land tax, *Moratorium Act*, special relief income tax *et cetera*.

The Minister, by his action in forcing the bill through Parliament with almost indecent haste, and in steadfastly refusing to consider the legitimate demands of the medical practitioners, has created a crisis which now compels them to face realities. For political motives the Government insisted on making the National Health and Pensions Insurance Bill law without modification of its contents, and in order to placate the rebels within its own party, as well as the Opposition, a promise was made to set up a Royal Commission at a later date to inquire into certain aspects of the Act.

The scope of this commission is very limited, being confined almost entirely to the question of finance (fees *et cetera*); the all-important burning question of "terms of service" is not to be considered.

So far as the future welfare of general practitioners is concerned the question of payment is of secondary importance; the crucial matters are the terms of service.

The National Health and Pensions Insurance Bill gives the Minister in charge power to make regulations, which have the force of law. Though Parliament has the power to disallow regulations, this is very seldom done, largely because members have not the requisite technical knowledge to enable them to understand their import. This is an indication of the enormous power which Parliament has delegated to officials, permitting them thus to control the life of the community.

Under the *National Health and Pensions Insurance Act* the medical practitioners will become part and parcel of the civil service. They will have to submit to all the disadvantages of such a system without any of the compensating advantages; for there will be no limit to hours of work, no provision for sickness and holidays on full pay, and no superannuation fund.

At all costs we should unite and struggle to preserve our freedom from government control. Our aim must be to retain our liberty and independence.

Whilst endeavouring to arrive at a correct solution of our present troubles, it will be as well to keep in mind the following information:

I. *Great Britain*: Previous to the *National Health Insurance Act* many and various forms of contract practice prevailed all over the industrial areas (cities, towns, factories, coal mines *et cetera*), in medical clubs, benefit societies, trades unions, shilling dispensaries *et cetera*. Under this system medical earnings had reached such a low level that doctors could not possibly maintain any decent standard of service—it became simply a struggle for existence on their part. Over 30% of medical practitioners were engaged in work under this degrading system. In their case it was inevitable that the *National Health Insurance Act* would prove acceptable; for nothing could be worse than the prevailing state of practice at that time. As a result the British Government received sufficient support to enable a start to be made with its panel scheme, even in the face of the opposition of the great majority of medical practitioners. Compare the conditions described above at the time of inauguration of the British insurance act with the state of medical practice in Australia at the present time. They have no resemblance to one another; no comparison is possible. The medical profession in Australia is supplying all classes of citizens with medical service of a standard second to none in the world. The Federal Government has no justification whatever for its interference in the realm of medical practice; for every Australian citizen is able to obtain efficient medical service at need. There is no logical reason to support the inclusion of medical service in the Federal *National Health Insurance Act*.

II. *Motives of the Federal Government*: The apparent motives of the Federal Government in formulating the national health insurance scheme are: (a) to ease the burden on the exchequer of all pensions (old-age and

invalidity); (b) to steal some of the most valuable political assets of the Labour Party.

The medical benefit (at twopenny halfpenny per week) is being used as an inducement to the labouring classes to overlook the fact that they will be made to contribute to their pensions for the first time in history.

The correct title for the bill should be "The National Pensions Act". The medical profession is of little importance politically; its voting strength at elections is negligible, which is the reason why its members have received such cavalier treatment at the hands of the Government. Our legitimate demands have not been worthy of consideration.

III. *The Royal Commission*: The Federal Government has been compelled to grant this favour to its opponents and the rebels within its own ranks in order to gain its objective, namely, to place the *National Health and Pensions Insurance Act* on the statute book to all intents and purposes in its original form. The Minister has not bound himself to accept the finding of this commission, so there is no reason why we should not adopt a similar attitude. The determination of the Minister to refuse to consider the legitimate demands of the medical profession should act as a warning to us all as to what treatment to expect in the future, more especially in view of Mr. Casey's repeated assertion that nothing would be done which would upset the actuarial basis of the bill. Need any more be said? For there the Minister supplies us with positive evidence that all he is concerned with is finance and nothing but finance. Moreover, the terms of reference refer only to matters of payment.

IV. *Independent Investigations into the Working of the British National Health Insurance Act (that is, the Panel System)*: (i) In 1933 a medical man from South Africa visited England and examined the *National Health Insurance Act* in operation with a view to its introduction into South Africa. He reported as follows: "The institution of the panel system, as it works today in England, would not be a help, but a tragedy, for the medical profession of this country" (South Africa). (*Vide The South African Medical Journal*, October 28, 1933.)

(ii) The American Medical Association set its bureau of economics to work. England was visited and the panel system was thoroughly investigated. The full report can be studied in *The Journal of the American Medical Association*. I shall merely quote the following paragraph:

The most valuable lesson we can learn from British experience is not that we are doomed to adopt sickness insurance, but rather how we can escape that fate.

Once we realize the danger of allowing ourselves to come under the control of bureaucracy, then logically we should refuse to give medical service under any health insurance scheme controlled by government regulation. In which case there will be no necessity for us to collect data to place before the commission appointed by the Government. It will become our duty to prepare a statement setting out the position taken up by the united medical profession, emphasizing our readiness to provide a truly national health insurance scheme of such a nature as to be acceptable to all the citizens on the lower income limit.

Our profession in New South Wales has worked under a system of health insurance for many years, which has proved satisfactory to all parties concerned; the history of our common lodge agreement during the past twenty-five years supplies ample proof of that fact.

In conclusion, all Australian medical practitioners would be well advised to take heed of the warning uttered by Lord Hewart, Lord Chief Justice of England (1929). The following are a few quotations from his book, "The New Despotism":

The bureaucratic despot we already have. To take a simple instance, the treatment of the panel doctors under the *National Health Insurance Act*, which is pure despotism. The doctors are liable, at the mere discretion of the official who acts for the Minister of

Health, to be ruined professionally by being struck off the panel, or, as a lesser punishment, to be fined to an arbitrary extent.

Regulations having the force of law come into force without the knowledge of Parliament.

This eminent lawyer, Lord Chief Justice Hewart, has written his book in order to warn his fellow citizens as to "the pretensions and encroachments of bureaucracy", that is, "the new despotism" or government by regulation. We must heed this warning, coming as it does from such a source, and unite to protect our freedom and independence. Professor Joad has truly written: "Men value liberty only when it is denied to them, but its denial is a denial of all that makes life worth living." If we are to preserve our medical freedom and liberty we must realize what they are worth and what their disappearance would involve.

The Federal National Health Insurance Bill has been passed in skeleton form; the gaps have been left to be filled up with rules, orders and regulations. The administrative department is given power to make all necessary regulations, having the force of law, and from which there is no appeal. The exercise of this arbitrary power is neither law nor justice. In Great Britain the morale of the medical profession has been considerably lowered as a result of the disturbing and irritating conditions of work imposed by departmental regulations. Prevention is better than cure, and indescribably better than mitigation; therefore let us unite and once and for all prevent the imposition upon our profession of the system of tyranny and despotism known as "government by regulation".

Let our final unanimous decision be to refuse to accept service in any scheme of health insurance controlled by government, whilst we will loyally give our support to any suitable scheme free from bureaucratic control, such as: (i) a scheme to be inaugurated by the medical profession, or (ii) a scheme in cooperation with the friendly societies.

Correspondence.

THE TREATMENT OF BRONCHIECTASIS IN CHILDREN.

SIR: In an article recently published in *THE MEDICAL JOURNAL OF AUSTRALIA* of July 2, 1938, by Dr. Milton Coutts, of Sydney, the treatment of bronchiectasis in children is discussed in detail, *re* postural drainage, bronchoscopic lavage *et cetera*. In view, however, of the absence of any reference to a modern conservative method of treatment some comments appear desirable. The general consensus of opinion certainly associates bronchiectasis with sinus infection as a frequent antecedent causative factor. However, unresolved bronchopneumonia is another important factor often overlooked in the aetiology. It is the incipient type or the prebronchiectatic lung, concerning which there is general agreement with Dr. Coutts, that there should be earlier recognition and effective treatment before the development of the gross pathology of "the damaged lung of childhood" associated with foul expectoration and pulmonary fibrosis. From the prophylactic and curative point of view, especially in the hopeful early stages, I am rather surprised at Dr. Coutts's omission to refer to the beneficial effect of ultra-short-wave therapy as a valuable adjunct in the conservative treatment of early bronchiectasis and of its frequent precursors, namely, nasal sinus infection and antecedent unresolved bronchopneumonia.

In considering surgical treatment of sinusitis in childhood we are all familiar with the difficult type of case in which offensive expectoration and cough fail to clear up after tonsillectomy and adenoidectomy. Such difficult cases readily develop bronchiectasis and present a serious problem even in collaboration with a skilled rhinologist. It is my experience that gratifying results can often be obtained in difficult cases of that type by means of infra-red and ultra-short-wave therapy without performing intra-

nasal antrostomy and radical Caldwell-Luc operations. In many cases cooperation between the rhinologist and physiotherapist is essential in considering a preliminary antrostomy. Even without resorting to surgical intervention the progressive improvement in resolution of this type of sinusitis under modern physical therapy can readily be checked up by daily transillumination showing diminishing opacity of affected antra. The toxic manifestations usually clear up, with restoration of function of affected mucous membrane and natural drainage through decongestion of ostia of sinuses.

In this journal Dr. Eric Gutteridge, of Melbourne, recently stressed the value of physical therapy in a similar manner in oto-rhino-laryngology. For the perusal of those interested in this subject I would also commend an excellent article written by Dr. Moss, of the Perth Children's Hospital (THE MEDICAL JOURNAL OF AUSTRALIA of March 5, 1938), in which similar attention is drawn to the value of this conservative therapy after extensively reviewing disappointing and dangerous procedures in chest surgery. Dr. Moss has undoubtedly rendered a service to the profession in Australia by stressing recent advances abroad in physical therapy which have come to stay and which represent the most significant contribution of recent times to the progress of physical medicine.

Allied to the development of bronchiectasis I wish to refer to lung abscess and its frequent precursor, namely, pneumonitis, which likewise demands earlier recognition and adequate treatment. Pneumonitis is a fairly common condition. It is a useful modern term in referring to a localized or generalized pulmonary infection where the condition has not progressed to the final stage of breaking down of lung tissue and cavity formation. In my experience ultra-short-wave therapy is often the treatment of choice in promoting the resolution of an acute inflammatory exudate within the lung associated with the development of unresolved pneumonia, early bronchiectasis, lung abscess and allied conditions in which surgery may be contraindicated. By means of an operating fluoroscope one can check up clinical diagnosis and progressive improvement under therapy.

In the physiotherapy departments attached within recent years to many of the teaching hospitals in England, France, America and on the Continent, there is now a growing recognition of the value of such therapy, which has produced results so consistent that it is not a case of *post hoc* and *propter hoc*. It is unfortunate, however, that in Australia, with its isolation from research centres, there still exists a certain amount of misunderstanding and lack of appreciation as to its definite indications, in spite of its value as a life-saving measure in cases which could not be treated effectively by any other method. Lung abscess, for example, is a lesion which directly endangers life, and any improvement in therapeutic results should be welcomed in the best interests of the patient. Spontaneous cure by fortunate rupture into a bronchus is, of course, always possible. Other cases may be amenable to a two-stage drainage operation; but in considering the prognosis of pulmonary abscess the general statistical conclusion must be drawn that surgical procedures yield about 35% mortality, which rate should be lowered. Post-operative complications in chest surgery for lung abscess are familiar to all of us. Personal observations and recollections at the Brompton Hospital in London and at the Sauerbruch Clinic at the Charité Hospital bring to my mind unfortunate cases of bronchial fistula, gangrene supervening in the abscess wall, empyema, secondary pulmonary hemorrhage *et cetera*. In the conservative treatment of many suppurative conditions of the lung there is no doubt, judging by excellent results in various countries, that ultra-short-wave therapy is destined to displace many dangerous surgical procedures, thus avoiding an attack on the chest wall, with its attendant dangers and higher mortality rate. Resolution of a deeply situated lung abscess or acute inflammatory exudate can be achieved by a modern conservative therapy which is perfectly safe and possessing definite advantages over conventional diathermy in offering: (i) a more uniform heating, especially in such favourable dielectric conditions as exist in the lung; (ii) greater depth effect in the

resolution of pathological foci; (iii) better localization and penetration, especially with the Schliephake air-spaced glass electrodes; (iv) the avoidance of skin-heating edge effects; and (v) the facility and convenience with which electrodes can be applied without removal of clothes of a feverish patient.

There is absolutely no danger to the patient, who is placed in the secondary circuit of a condenser field. With careful attention to detail the technique of application is not difficult to acquire. No electrodes are actually touching the patient, yet the efficacy of this homogeneous trans-thoracic therapy is undoubted in producing rapid resolution of deeply situated inflammatory exudates within the lung. Children experience no discomfort and require only a gentle heat for depth penetration. In conclusion I wish to plead for a tolerant attitude towards those who are labouring in bringing physical therapy out of the mists of conservatism, through which all new methods pass, into the clarity of established scientific exactitude.

Yours, etc.,

PHILIP ALPERS,
M.R.C.P. (Lond.), F.R.C.S. (Edin.).

Lister House,
North Terrace,
Adelaide.

July 21, 1938.

NATIONAL HEALTH INSURANCE.

SIR: I have just read an address delivered by Dr. R. O. Williams before the Central Southern Medical Association on July 1, 1938.

Dr. Williams's address expresses so well the point of view of the vast majority of general practitioners that I commend it to you as worth reprinting in the journal. It has prompted me to withhold my subscription to the National Health Insurance Emergency Fund. This fund is to be used chiefly for preparing and presenting evidence before a royal commission, an obvious waste of money.

In a recent vote we have said, almost unanimously, that we are not prepared to accept service under the national health insurance scheme.

Surely it is high time for our representatives to say to the Federal Government: "Your scheme may be actuarially sound as far as it applies to pensions and sickness benefit; as far as medical benefit is concerned, it is hopelessly bad for the public and degrading to us; no amount of amending can make it good; you may as well repeal it, because we will have nothing to do with it; if you are anxious to see a national medical benefit scheme inaugurated, leave the job to us and we will do it, but give us three years to prepare it, not three months."

To a fund devoted to the above object I would willingly contribute ten guineas.

Yours, etc.,

"G.P."

East Maitland,
July 27, 1938.

SIR: Dr. Griffin Lipscomb has been eight years in England; for some time in the Midlands doing hospital work and *locum tenens* work in panel and private practices.

For five years he has been in a mixed private and panel practice within a quarter of an hour of the centre of London.

The following is an extract of a letter from him, dated June 30:

... I was very interested in your cutting from THE MEDICAL JOURNAL OF AUSTRALIA re national health insurance. National health insurance in Australia was inevitable. I wonder how many of the profession realize what it really means. It is very different to lodge practice. It is and will mean a radical change in practice, and general practice as you and your generation knew it is, for good or for bad, of the past. It spells commercialism, a lowering of status of the doctor, and of the principles and ideals of

medicine as you and your friends knew and practised. I am convinced it would have been far better for the profession (and the public) to have taken the offensive and stood out for a national medical service, that is, all the family on the "panel". It can be done in two ways: either the doctor is a salaried government servant or else he is allowed so many families fully insured and thus has a fixed income. Indirectly now you will find that the consultants will suffer, more hospital work, more operations, more people out for something for nothing. I know you and others will think I take a pessimistic view, I judge on English standards, that circumstances there are different *et cetera*, but I am convinced that my words and views are and will prove right. The lodge and panel are fundamentally different, one you are your own master (within reason), the other you are a part-time government servant (without superannuation). Why not go the whole hog and be a full-time government servant, with regular hours, holidays, superannuation and the rest of it? You get what you pay for and if the public want doctoring on the cheap, let them have it so. The increasing number of entrants into the medical profession out there, without a corresponding increase in the number of the population, plus the increasing cost of medical treatment (on account of X rays, laboratory tests, psychological medicine, preventive medicine, glandular products *et cetera*) must inevitably result as it has done here in a lowered average income of the doctor.

Yours, etc.,

T. W. LIPSCOMB.

Sydney,
August 3, 1938.

AN EYE HOSPITAL AT SYDNEY.

SIR: May I seek the hospitality of your columns for a few remarks in reply to a letter which appeared in *The Sydney Morning Herald* of July 27, by a Dr. Maude, in which he urged the necessity for an eye hospital, and incidentally implied that, in its absence, we are a pretty backward lot in Sydney. My remarks in reply might have been sent to the *Herald*, but I feel that the discussion of such matters in the lay Press is to be deprecated, as it can get us nowhere in the direction aimed at. Perhaps, however, when accompanied by a complete list of the recently acquired diplomas of the writer, that statement should be modified.

He considers that, except in a "special" hospital, with ample funds for equipment, research is hampered and stifled, or at least is not encouraged, and that the special department of a general hospital has a sort of inferiority complex, in which research is not to be expected.

By research I presume he means pathological and physical research. As regards clinical research, I imagine that this never ceases among men of reflective and critical minds who are not hide-bound by tradition, and that new methods of technique and treatment are being constantly tried out and new conceptions of pathological processes are being realized.

As regards pathological and physical research, we all know the old adage about stone walls and prison bars. Well, marble halls and elaborate equipment do not make the research worker. It is the man behind the microscope. Research brains are rare. When found, they should be subsidized by an ample salary and absolved from the necessity of practising for a living. Pasteur conducted his early researches in very bare surroundings. Priestley Smith, who achieved a world-wide reputation for his researches into the pathology of glaucoma, was the ophthalmic surgeon in charge of the ophthalmic department of one of the smaller general hospitals in Birmingham, though a large special eye hospital was in existence in the city. He measured and weighed his series of one thousand lenses in the *post mortem* room, and conducted his hydrostatic experiments in an attic in his own house. Had he been surgeon to the Eye Hospital, the material would not have been at his disposal, as eye

patients do not die—at any rate in hospital. The pathology departments of the various hospitals in Sydney with special eye departments offer all facilities for research; the Royal North Shore Hospital, in point of fact, has a well-equipped, staffed and endowed medical research institute. If we have not availed ourselves of its amenities for ophthalmic research it is probably because we have not the right quality of brain for that class of work, or the urge to do it.

Several of our Melbourne and southern colleagues have published excellent monographs embodying an immense amount of clinical research; but, so far as my memory serves me, these have not emanated from men on the staff of the eye and ear infirmary, but from men on the staff of general hospitals with special departments. This, of course, is merely coincidence.

Let it not be thought that I have any *a priori* objection to an eye hospital being founded. It may or may not be needed. All I wish to convey is that elaborate equipment and money will not produce research. If a man has the right kind of brain and the urge he has ample facilities at any of the present Sydney hospitals. A special department is just what its incumbents make it, and just as good work, not only clinically but pathologically, can be done there, given the urge and the ability to do it. In one of my hospitals all excised eyes of pathological interest are frozen, bisected and mounted by the simple Priestley Smith method and kept. This can be done easily and quickly even in the out-patient department.

As regards orthoptics (which is another story), there is no doubt that this very valuable adjunct to treatment is grossly abused and misused. I have said nearly enough on that subject in this journal (March 27, 1937); but in *The British Journal of Ophthalmology* of April, 1938, Law, of London, in a long statistical paper emphasizes that there is an immense amount of economic waste from loss of time and money and railway and tram fares in the indiscriminate application of orthoptic methods to cases where it should have been recognized early that they were entirely unsuitable for, and unlikely to benefit by, it. The Children's Hospital has had a flourishing clinic for some years, which does excellent work; there is another at the Medical Eye Service for intermediate patients, and there are two qualified lay private practitioners, besides several oculists who use it personally. It has undoubted value at certain stages in the treatment of suitable cases, but as a universal panacea for the cure of squint it has been altogether overrated; and most orthoptic practitioners will endorse this view.

The chief argument in favour of the special department as opposed to the specialist hospital is that in the former the oculist is kept in constant contact with general medicine in its relation to his specialty, by means of his very frequent consultations with the physicians on the staff, thus broadening his view. However, any scheme for the improvement of pathological teaching in ophthalmology will have my support.

Yours, etc.,

141, Macquarie Street,
Sydney,
July 28, 1938.

E. TEMPLE SMITH.

DEATH FROM ARTERIAL SPASM.

SIR: The interesting case reported under this heading by Dr. John F. J. Cade (*THE MEDICAL JOURNAL OF AUSTRALIA*, July, 1938, page 168) is capable of a different explanation from that which he tentatively assigns to it. When long loops of the intestine become strangulated (not necessarily obstructed), as in volvulus and superior mesenteric thrombosis or embolism, blood is poured into the lumen and death occurs early from shock. This appears to have been such a case. When the strangulated length of intestine is short, as in "gangrenous appendicitis" and usually in hernia, death occurs late, from peritonitis or the effects of obstruction.

Yours, etc.,

Sydney,
July 30, 1938.

"AN OLD SAD SURGEON."

Proceedings of the Royal Commission Appointed to Inquire into Matters Pertaining to National Health Insurance.

THE Royal Commission on National Health Insurance is constituted as follows:

HIS HONOUR CHIEF JUDGE DETHRIDGE, Chairman.

SIR GEORGE MASON ALLARD, Member.

DR. R. D. MULVEY, Member.

The Commission first met at Sydney on August 8, 1938.

Mr. W. R. Dovey, K.C., and Mr. J. Bowie Wilson (instructed by the Commonwealth Crown Solicitor) appeared to assist the Commission.

Mr. L. S. Abrahams, K.C., and Mr. A. C. Gain (instructed by Messrs. Allen, Allen and Hemsley) appeared on behalf of the British Medical Association.

Mr. Dovey traced the history of the negotiations between the Federal Council and the Commonwealth Government and discussed the reasons for the appointment of the Royal Commission. He quoted from a letter, dated May 21, 1938, written by the Secretary of the Federal Council to the Commonwealth Treasurer, as follows:

We also know that the members of the British Medical Association are willing to cooperate with the Government in the implementation of the bill and the provision of medical services under it, if the terms offered by the Government are acceptable to them.

The terms contained in our letter to you of 21st May would be acceptable to our members.

Mr. Dovey then spoke as follows:

Those terms, briefly, were a suggested minimum of 14s. in the metropolitan area, with an additional 25% in country areas. In view of the inability of the executive committee of the Federal Council to honour the earlier agreement the Commonwealth Treasurer, instead of reopening the negotiations, stated in the House of Representatives on June 15 that it was the intention of the Government to set up a royal commission of inquiry. He then said:

The Federal Council of the British Medical Association has asked that negotiations be reopened on the agreement previously made, but the Government can have no security that any agreement reached by negotiations with the Association would be accepted by the profession generally, and it cannot proceed on the basis of the demands now being made. The Government has therefore decided to set up a royal commission to advise it regarding the proper payment to be made for the treatment of persons insured under the national insurance measure. The Government intends also that the commission shall investigate the financial aspects of the voluntary provision of medical treatment for the wives and children of insured men, to whom the Government has promised some assistance. The commission will be constituted as soon as practicable, and it is intended that the friendly societies, as well as representative members of the medical profession and the National Insurance Commission, shall have every opportunity to submit evidence.

This is that commission. At the same time it was announced, either by the Treasurer or by the Prime Minister of the Commonwealth, that this Commission would sit in each capital city of the Commonwealth in order to take evidence. . . .

I next desire to indicate very shortly the manner in which it is proposed, subject always to the direction of this Royal Commission, to present the evidence. The Commission, and my learned friend Mr. Abrahams,

appreciate the position; but at this early stage I should like to make it clear to any person or organization who or which may desire to bring forward evidence that my learned friend Mr. Bowie Wilson and I are not here representing any party. We have been appointed by the Commonwealth Attorney-General to assist the Commission, and our task as we conceive it, subject to direction by this Royal Commission, will be to put forward and to deal with any evidence on its merits, in an endeavour to arrive at facts. In passing, may I say that the members of the National Insurance Commission have asked me to state that so far as they are concerned they in no way regard this inquiry as a contest between themselves and the medical profession or any branch of it. Of course, my learned friends Mr. Abrahams and Mr. Gain are avowedly advocates for the British Medical Association and the members of that association, on whose behalf Mr. Abrahams has announced their appearance. Illustrating the neutral attitude that we take up, I undertake to continue to do as I have already done, namely, to make available to my learned friend Mr. Abrahams in advance the proofs of any witness whose evidence may be put before this Commission by us, wherever it is practicable so to do. In view of the wide field over which this evidence may travel, I should appreciate like consideration from my friend, because in conversation he has told me that certain material has been collected on behalf of his clients. . . .

Mr. Abrahams applied for an adjournment in the following terms:

May I say at the outset that it is the desire of my client to assist the Commission in two ways, one by presenting an orderly case rather than a tangled mass of detail, and the other by attempting, so far as the needs of the Royal Commission require, to go on with the case once it is commenced, wherever the commission may be, subject, of course, to reasonable notice being given as to where the Commission will be. There is another way in which we think the Commission may be assisted to avoid delay. If we have any figures to present, or anything which will require prolonged examination, either by the Royal Commission or by counsel assisting the Royal Commission, they will, where practicable, be supplied in advance. Although we propose to do all in our power to assist the Commission, we must have an opportunity to prepare these matters. Mr. Dovey seems to have the idea that the suggested adjournment is asked for on the ground of personal convenience. That is not so. The position is that so far my clients have been unable in the time at their disposal to prepare the vast amount of material which is necessary in their interests and in the interests of the public for submission to the Royal Commission. In the first place, it was only on Saturday last that my clients were supplied with a final statement of the medical services proposed to be rendered. On July 20 Mr. Brigden forwarded a statement of the proposed services. We understand that it is not convenient to pass regulations on the subject, because that part of the Act has not been proclaimed; but on July 20 we were sent a list of the proposed medical services to be rendered. That list has been materially altered, according to Mr. Brigden's evidence, which was placed before us last Saturday. For example, the definition of "confinement"—the very first item on the list—has been very materially altered according to the list supplied as late as after 11 o'clock last Saturday morning; that is, the list contained in the proposed evidence of Mr. Brigden. That is a very great disadvantage under which my clients have been during some weeks past, not knowing what services they are to be asked to render and in respect of which this Commission is about to investigate the appropriate amount of payment. It may be observed in passing

that the National Insurance Commission itself, which has been engaged for some considerable time, is still, according to Mr. Bridgen's proposed evidence (pages 15 and 16), collecting its statistical material, which we are endeavouring to collect, not from the friendly societies but from 4,300 members scattered throughout the various States and in the remote districts of Queensland and Western Australia. For some time the British Medical Association has had Dr. Price in Western Australia, Queensland and South Australia interviewing medical practitioners, some of whom are specially affected. There is a vast difference, the Royal Commission will readily see, between the position of a practitioner situated in a large centre like Sydney and one situated on the Kalgoorlie goldfields or in Bunbury, the timber district of Western Australia. The conditions applicable to those practitioners are to a very large extent different from those applicable in the metropolitan area. Some of them, at the moment, have special contract agreements and special contract rates. Their case will require presentation in at least a modified form compared with the form adopted in respect of the general case. Consideration of these matters and of the requirements of 4,300 members has had to be given during the last few months, and it has been impossible in the time at our disposal to prepare the whole of the case for the whole of Australia. May I call attention to the dates upon which various matters occurred. On June 11 an *ad hoc* committee, consisting of the Federal Council of the British Medical Association and one general practitioner representative from each State, was formed and entrusted with the handling, on behalf of the Association in Australia, of all matters concerning the *National Insurance Act*. The intention of the Government to appoint the Royal Commission was first stated by the Treasurer, as my friend has said, on June 15. During the following fortnight the members of that *ad hoc* committee returned to their respective States, consulted the State Branches and their members, and prepared a draft of a *questionnaire* to be submitted to members in the various States. It is a very comprehensive *questionnaire* and requires consideration by medical practitioners of the type of patients they have, the amounts of their income, and so on. A fortnight was needed for that to be drafted, because of the necessity for consultation between the Branches in the various States. That occupied until somewhere about July 6. The solicitors and the counsel were retained on June 27. The committee met in Melbourne on June 30 and July 1, and the general lines of the case to be presented to the Royal Commission were decided upon and the form of the *questionnaire* was settled. It was also decided at that meeting to create a fund. That has been a very necessary element in this case. Doctors who have been engaged in assisting him in the preparation of the case have had to be supplied with *locum tenens*, and a vast amount of expense has been incurred in travelling and in other ways. There is no special fund set apart by the British Medical Association for procedure such as they are going through now. That appeal was sent out on June 30. The Act became law on July 5 and the first batch of *questionnaires* was printed and dispatched to Western Australia by air mail on July 6, the date on which the terms of reference were announced. Nobody can complain that there was any delay up to that point. On the following day, July 7, the remainder of the *questionnaires* were sent to Queensland, Victoria, Tasmania and South Australia. I believe that the New South Wales *questionnaires* were sent out on the same day. The *questionnaire* consisted of two documents, one asking for the information I have already indicated, concerning income, nature of practice, patients, and so on, and the other one requiring the collection of data between July 14 and August 14. No medical practitioner can tell from his books or from other records which of his patients are earning up to £365 a year. The Royal Commission, of course, knows that the income limit in the case of a non-manual worker is £365 a year, and in the case of a manual worker it is unlimited. No doctor can learn by searching his past records which of his patients fall within the income limits and which do not. If he wants any material on those subjects, the most vital of all, to place before the Com-

mission—because the doctors want to inform the Commission as to how much of their private practice they are to be deprived of—that material must be collected from future inquiries. Therefore, between July 14 and August 14 they are collecting information in order to be able to present to the Commission a tabulated case showing how much of their private practice they will be deprived of by the operation of the act. That cannot be done except in the way that I have mentioned. Hundreds of these *questionnaires* are coming in slowly, and an attempt is being made to dissect the information contained in them. Large staffs are engaged in every State. Additional staffs have had to be put on. May I say in parentheses that if we were not doing this the Royal Commission's own officers would have to do it. I have assisted many a royal commission and have found that where the parties themselves have not done the work the commissions' own accountants and staffs have had to do it at their own expense. This is being done at the expense of my clients. I am in the position that I do not know one word of the case which is to be presented, except in general outline, and until I am instructed it is impossible for me to take any effective part on behalf of my clients in this Commission. I do not ask for any mock indulgence, because I realize that by getting an adjournment I shall save the time of the Commission; but I do ask to be allowed to present my clients' case in an orderly manner so as to do them justice and to save the time of the Commission. If I am to be here every day while this information is coming in and while a huge mass of documents is being read it will be impossible for me to present any satisfactory case to this Commission. Therefore, I ask that when this more or less formal evidence is taken the Commission will give my clients until August 29 to cross-examine Mr. Bridgen and any other witness who may be called, and to take any objection I may take, because I am not in a position to know how far Mr. Bridgen's evidence is objectionable from the viewpoint of my clients. I undertake on behalf of my clients to be ready on that date to go with the Commission wherever it goes and, subject to the exigencies of any particular situation, not to ask for any other adjournment.

After brief discussion the Commission decided to hear what evidence was immediately available and to adjourn until August 29, in Sydney. Counsel for the British Medical Association was granted permission to recall any witness for cross-examination at a later date if necessary.

In reply to a question from the Chairman, concerning the possibility of the publication of medical practitioners' evidence, Mr. Abrahams said:

In regard to evidence of earnings, I suggest that the Commission exercise its powers under the Act to have such evidence taken in camera. As to other matters, such as particulars regarding patients, they can be dealt with as they arise.

The Chairman promised that the Commission would exercise its powers to ensure that no harm would result to medical practitioners.

Mr. Dovey then discussed the *National Health and Pensions Insurance Act* and the terms of reference of the Royal Commission at some length. After some argument concerning the terms of reference and the relevancy of some of Mr. Dovey's remarks concerning the Act, James Bristock Bridgen was called.

Mr. Bridgen tendered as evidence a statement prepared by the National Insurance Commissioners. This statement contained certain matter that has already appeared in this journal; the remainder will be published in a later issue.

Mr. Abrahams questioned Mr. Bridgen concerning certain clauses in the statement. Part of this examination was as follows:

By Mr. Abrahams: I am asked to inquire whether all services given to an insured person prior to the twenty-eighth week of pregnancy and subsequent to the tenth day of the lying-in period will come within the scope of the insurance practitioner's service.

A.: Everything outside this definition is intended to come within the scope of the service.

Q.: Will you consider the matter and let us know?

A.: Yes.

Q.: Then I am asked to inquire as to whether you will explain if an insurance practitioner will be able to charge for any service necessitated by sequelæ extending beyond the tenth day, for example, puerperal sepsis. Will you consider that?

A.: Certainly. These words are taken from the British range of service. We shall be able to use British experience in deciding these points.

Q.: Item 2 deals with cases falling within the provisions of certain acts under which compensation is payable to the worker. I am asked to inquire whether the services now rendered by practitioners to persons coming under the *Australian Soldiers' Repatriation Act*, who will become insured persons, will be included in the terms of service.

A.: They are not excluded here. I understand that such persons will have the right to come under the Australian soldiers' service conditions. We are giving soldiers certain options and privileges under this Act. I imagine that doctors who are paid for services by the Repatriation Commission will prefer to be paid by that commission rather than to take it as part of their service under this scheme.

Q.: The point is that they will be bound to give their services under this system and at the fee fixed *per annum*.

A.: That is so; it is within the scope of their service, but we know quite well that they will be paid for it in another way.

Q.: The point is, you do not propose to exclude them?

A.: No.

Q.: Will services rendered to persons who have a claim for damages under common law be excluded from the scope of service?

A.: Under statute law only. We take the line that where the statute law imposes a liability under which service must be paid for we do not cover that a second time.

Q.: So that if an insured person brings a claim for damages at common law for negligence in a motor car accident he will not be able to claim any damages from the person responsible in respect of the doctor's fee and the doctor will have to render service at the insurance practitioner's ordinary rate?

A.: That is a legal question.

Q.: At any rate you do not intend to exclude treatment in respect of people who have a claim for damage at common law?

A.: No, we do not intend to exclude them.

Q.: Item IV deals with anaesthetics necessitating the presence of a second practitioner. I am asked to inquire whether the insurance practitioner who gives an anaesthetic to an insured person operated upon by another practitioner is entitled to charge for such anaesthetic.

A.: On my reading, yes, the second practitioner being in attendance, unless he is outside the range of the service.

Q.: Item VI—pathological investigation *et cetera*. I am asked to inquire whether all pathological investigations are excluded.

A.: Yes, subject to some minor matters, which I shall presently explain, which may be negligible, in relation to service.

Q.: Item VII—consultations. I suggest, Mr. Brigden, that that implies that if after a clinical examination it is found necessary to have a consultation with another practitioner, the general practitioner is entitled to charge a fee for the consultation.

A.: If he is one of the consultants, yes; if the insurance practitioner is consulted after this preliminary, he can charge a fee.

Q.: It is suggested to me that there are many cases of urgency in which it is impossible to have a full clinical investigation but in which a consultation might be necessary. For example, a doctor is summoned at midnight and he considers it necessary to have a specialist. Is it suggested that if he acts as a consultant in that case he is not to be paid specially?

A.: If the insurance doctor is called in for a consultation and there has been no full clinical investigation, that insurance doctor will find it within the terms of his practice, if the consultation is in respect of a man on his list. There is no question of what an outside specialist may charge.

Mr. Brigden was also questioned by Mr. Dovey.

The Commission adjourned at 4.30 p.m. until 10.30 a.m. on August 9, 1938.

(To be continued.)

Congress Notes.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION): SIXTH SESSION.

We have been asked to publish the following circular letter, copies of which have been dispatched by the Honorary General Secretary of the sixth session of the Australasian Medical Congress to various medical bodies overseas and to Branches of the British Medical Association in Australasia.

"Shell House",
Perth, W.A.,
June 25, 1938.

Dear Sir,

The Sixth Australasian Medical Congress will meet in Perth, Western Australia, at the end of August, 1940.

The main theme of Congress is "Rheumatic and allied disorders".

It is hoped that one prominent British medical man in each of the Sections of Medicine and Surgery will attend. Other Sections may be similarly honoured.

Each Section has a Secretary appointed from this State and a President who will be a senior specialist selected from one of the other States or New Zealand.

This is an excellent opportunity for any of your members desirous of taking a holiday about Congress time. We have selected August as it is the beginning of the wild flower season and also climatic conditions are then at their best.

Sydney and Melbourne should be within an easy day's travel by air to Perth; New Zealand about two days, and London about five days.

This notification may appear to be premature, but nevertheless it will give intending members of Congress ample opportunity to formulate their plans early.

Any member wishing to participate in any of the discussions should write to me.

The President (Dr. D. D. Paton) and Executive Committee extend to your members a hearty invitation and will do all in their power to ensure them a warm welcome.

All members of the British Medical Association are eligible to join the Congress. Non-members must be nominated and approved by the Executive Committee. The Congress fee will probably be £2 2s.

Yours faithfully,

NOEL M. CUTHBERT,
Honorary General Secretary.

Obituary.

CARL EMIL DÖRSCH.

We regret to announce the death of Dr. Carl Emil Dörsch, which occurred on July 31, 1938, at Loxton, South Australia.

DOMINIC AUGUSTINE CAHALAN.

We regret to announce the death of Dr. Dominic Augustine Cahalan, which occurred on August 4, 1938, at Sydney, New South Wales.

Diary for the Month.

AUG. 16.—New South Wales Branch, B.M.A.: Ethics Committee.
AUG. 17.—Western Australian Branch, B.M.A.: Branch.
AUG. 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
AUG. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 24.—Victorian Branch, B.M.A.: Council.
AUG. 25.—South Australian Branch, B.M.A.: Branch.
AUG. 25.—New South Wales Branch, B.M.A.: Branch.
AUG. 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. F. J. B. Miller has been appointed Honorary Assistant Surgeon to the second Ear, Nose and Throat Department at the Adelaide Hospital, Adelaide.

Dr. G. E. Aitken has been appointed Acting Superintendent of the Parkside Mental Hospital and Acting Superintendent of the Hospital for Criminal Mental Defectives at Adelaide, South Australia.

Dr. A. J. Meikle has been appointed Acting Deputy Superintendent of the Parkside Mental Hospital and Acting Deputy Superintendent of the Hospital for Criminal Mental Defectives at Adelaide, South Australia.

Dr. G. H. Howard has been appointed Acting Superintendent of the Northfield Mental Hospital, South Australia.

Professor J. B. Cleland has been appointed Honorary Consulting Pathologist at the Adelaide Hospital, Adelaide, South Australia.

Dr. J. T. Gunther has been appointed, pursuant to the provisions of *The Workers' Compensation (Lead Poisoning, Mount Isa) Act of 1933*, of Queensland, a Member and Chairman of the Medical Board constituted by that Act.

Dr. G. S. Pro-Copis has been appointed Senior Medical Officer in the Office of the Director-General of Public Health of New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xviii to xx.

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Honorary Assistant Surgeon.
BRISBANE AND SOUTH COAST HOSPITALS BOARD, QUEENSLAND: Resident Radiological Supervisor.

CHILDREN'S HOSPITAL (INCORPORATED), PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.
GRESSWELL SANATORIUM, MONT PARK, VICTORIA: Resident Medical Officer.

METROPOLITAN INFECTIOUS DISEASES HOSPITAL BOARD, ADELAIDE, SOUTH AUSTRALIA: Resident Medical Officer.
ROYAL AUSTRALIAN AIR FORCE: Medical Officers.
ROYAL COLLEGE OF SURGEONS OF EDINBURGH, SCOTLAND: Conservator of the Museum, Director of Post-Graduate Studies.

THE LORD HOWE ISLAND BOARD OF CONTROL: Medical Officer.
THE QUEEN'S (MATERNITY) HOME INCORPORATED, ROSE PARK, SOUTH AUSTRALIA: Resident House Surgeon.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Prosperpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 173, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such a notification is received within one month.

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